

ARTICLES

CLIMATE RISK IN THE ELECTRICITY SECTOR: LEGAL OBLIGATIONS TO ADVANCE CLIMATE RESILIENCE PLANNING BY ELECTRIC UTILITIES

BY

ROMANY M. WEBB,* MICHAEL PANFIL,** & SARAH LADIN***

Electricity generation, transmission and distribution, and load are all impacted by weather patterns. Electric system assets have been designed for historic weather conditions with the goal of ensuring reliability and quick recovery following extreme events. However, climate change is causing major shifts in historic weather patterns and more frequent and severe extremes, which are creating new risk profiles for the electric system. Proactive climate resilience planning by electric utilities to identify, respond, and rationally allocate these climate risks is thus increasingly salient. This Article argues that it is also legally required.

Recently published industry studies demonstrate that accurate, specific, and actionable climate resilience planning is possible. Nevertheless, and despite the significant benefits of climate resilience planning, relatively few electric utilities have engaged in the process. This Article explores two legal doctrines, public utility law and tort law, which we argue obligate electric utilities to plan for the impacts of climate change on their assets and operations. Public utility law requires electric utilities to meet, among other things, prudent

*Romany M. Webb is an Associate Research Scholar at Columbia Law School and Senior Fellow at the Sabin Center for Climate Change Law.

**Michael Panfil is Lead Counsel and Director of Climate Risk Strategies at Environmental Defense Fund.

***Sarah Ladin is an Attorney at the Institute for Policy Integrity at New York University School of Law. This work was completed while an attorney at Environmental Defense Fund. This document does not purport to present the views, if any, of New York University School of Law.

investment and reliability standards. Tort law establishes a duty of care that obligates electric utilities to, among other things, avoid foreseeable harm when performing acts that could injure others. We argue that, as climate science becomes more precise and predictive, these legal standards take on new meaning and require electric utilities to engage in climate resilience planning.

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I. INTRODUCTION

The electric system is significantly affected by weather conditions.¹ High temperatures increase demand for electricity while simultaneously reducing the operating efficiency of thermoelectric generating facilities and the carrying capacity of transmission and distribution lines.² Droughts can force the curtailment or shutdown of hydroelectric and other water-dependent generation, as can storms and flooding, which can also damage or destroy transmission and distribution infrastructure.³ Seeking to reduce these and other risks, electric system operators have designed their infrastructure in the context of historic weather patterns, with the goal of ensuring reliability and quick recovery following extreme weather events.⁴ However, with climate change now causing major shifts in historic weather patterns and more frequent and severe extremes, electric system operators must fundamentally rethink their approach.

The Fourth National Climate Assessment, published in 2018, concluded that “[a]nnual average temperature over the contiguous United States has increased by 1.2°F (0.7°C) over the last few decades and by

¹ See generally Craig D. Zamuda et al., *Energy Supply, Delivery, and Demand*, in *FOURTH NATIONAL CLIMATE ASSESSMENT: VOLUME II IMPACTS, RISKS, AND ADAPTION IN THE UNITED STATES* 174, 176 (David R. Reidmiller et al. eds., 2018) (providing examples of how different climates and weather events affect the energy system).

² *Id.*

³ *Id.*; see also Michelle T. H. van Vliet et al., *Vulnerability of US and European Electricity Supply to Climate Change*, 2 *NATURE CLIMATE CHANGE* 676, 676 (2012) (finding that, due to climate change-induced drought and heat, the capacity of fossil fuel and nuclear power plants in the U.S. will decline by 4.4 to 16 percent between 2031 and 2060).

⁴ See generally Brad Plumer, *A Glimpse of America’s Future: Climate Change Means Trouble for Power Grids*, *N.Y. TIMES*, <https://perma.cc/P3UR-H7ZZ> (noting electric grids are often designed around historical weather conditions to account for severe weather events).

1.8°F (1°C) relative to the beginning of the last century.”⁵ This temperature increase has led to more frequent and intense heat waves, droughts, storms, and other extremes, as well as environmental changes such as sea level rise,⁶ all of which are negatively affecting the electric system.

The number and severity of weather-related electricity outages have increased in recent years as system operators grapple with multiple compounding climate impacts.⁷ One example occurred in Washington state in the summer of 2015, when higher than average temperatures led to a spike in demand at the same time as a wildfire forced the shutdown of a transmission line, which in turn necessitated the curtailment of output from a hydroelectric generating facility.⁸ This led to a twenty percent shortfall in electricity supply which cost the local utility—Seattle City Light—approximately \$100,000 per day to replace.⁹ More recently, what may be the hottest terrestrial temperature ever reliably recorded in California, along with severe wildfires, contributed to a grid operator forced blackout in August 2020.¹⁰

As these experiences demonstrate, the consequences of climate change already present a significant physical risk to electricity infrastructure, with that risk expected to increase in coming years as climate change worsens.¹¹ The Chief Executive Officer of investment giant BlackRock, Larry Fink, recently observed that climate risk is “driving a profound reassessment of risk and asset values.”¹² The U.S. Commodity Futures Trading Commission’s report, *Managing Climate*

⁵ Katherine Hayhoe et al., *Our Changing Climate*, in FOURTH NATIONAL CLIMATE ASSESSMENT: VOLUME II IMPACTS, RISKS, AND ADAPTION IN THE UNITED STATES, *supra* note 1, at 72, 74.

⁶ *Extreme Weather Gets a Boost from Climate Change*, ENV’T DEF. FUND, <https://perma.cc/4MWA-XQ2W> (last visited Mar. 18, 2021).

⁷ ALYSON KENWARD & UROOJ RAJA, BLACKOUT: EXTREME WEATHER, CLIMATE CHANGE AND POWER OUTAGES 10–11 (2014), <https://perma.cc/QHR7-X9P7>; *see also* Alex Gilbert & Morgan Bazilian, *California Power Outages Underscore Challenge of Maintaining Reliability During Climate Change, the Energy Transition*, UTIL. DIVE (Aug. 19, 2020), <https://perma.cc/NJU7-TSWL> (discussing power outages and interruptions due to weather events).

⁸ CRYSTAL RAYMOND, SEATTLE CITY LIGHT CLIMATE CHANGE VULNERABILITY ASSESSMENT AND ADAPTATION PLAN 17 (2015) [hereinafter SCL CLIMATE VULNERABILITY ASSESSMENT].

⁹ *The Dep’t of Energy’s Functions and Capabilities to Respond to Energy-Related Emergencies, Including Impacts to Critical Energy Infrastructure: Field Hearing Before the Comm. on Energy and Natural Resources*, 114th Cong. 90, 96 (2016) (written testimony of Dr. Lynn Best, Chief Environmental Officer, Seattle City Light).

¹⁰ Kavya Balaraman, *California Regulators Plan Post-Mortem to Examine Cause of Rolling Blackouts*, UTIL. DIVE (Aug. 21, 2020), <https://perma.cc/7K4Y-2Z2A>.

¹¹ Zamuda et al., *supra* note 1, at 193; *see also* U.S. DEP’T OF ENERGY, CLIMATE CHANGE AND THE U.S. ENERGY SECTOR: REGIONAL VULNERABILITIES AND RESILIENCE SOLUTIONS 1-1 (2015), <https://perma.cc/V4R3-P9QH> [hereinafter CLIMATE CHANGE AND THE U.S. ENERGY SECTOR] (noting climate change impacts to the energy system “are expected to become more frequent and more intense in the decades ahead”).

¹² Larry Fink, *A Fundamental Reshaping of Finance*, BLACKROCK, <https://perma.cc/7GQS-QQ6P> (last visited Mar. 18, 2021).

Risk in the U.S. Financial System,¹³ similarly found that “[a]wareness is growing across infrastructure sectors, including energy, water, transportation, and communications, that physical risks do not just impact particular sites and locations, but also shorten the lifecycle of infrastructure and degrade its operational reliability.”¹⁴

A number of electric utilities have acknowledged climate risk in general terms in their corporate filings with the U.S. Securities and Exchange Commission and other documents.¹⁵ Most electric utilities are, however, yet to integrate climate considerations into system planning, design, operation, and other decisions.¹⁶ Indeed, only a handful of electric utilities have conducted a comprehensive assessment of where and under what conditions their systems are vulnerable to the impacts of climate change, and fewer still have identified and implemented measures to reduce those vulnerabilities. Consistent with industry parlance, in this Article, we refer to the process of assessing vulnerabilities and developing remedial measures as “climate resilience planning.”

This Article argues that electric utilities are legally obligated to plan for climate risks to protect already made investments and proactively improve future investment decisions. We identify two separate legal bases for such an obligation, though others almost certainly exist. The first is found in state public utility law, which requires electric utilities to provide customers with continuous, reliable service at just and reasonable rates—something that will not be possible unless electric utilities plan for future climate impacts. The second arises from tort law principles, under which electric utilities may be held liable for negligence if they breach an owed duty of care, which we argue here extends to failure to plan for reasonably foreseeable climate impacts.

This Article explores how public utility law and tort law can be used to drive climate resilience planning by electric utilities. We consider the feasibility of each approach and discuss relevant legal considerations, doctrines, and precedents. This Article should not be read, however, to endorse a particular litigation strategy or offer recommendations as to when, where, or how a particular approach should be pursued. The

¹³ U.S. COMMODITY FUTURES TRADING COMM’N CLIMATE-RELATED MARKET RISK SUBCOMM., *MANAGING CLIMATE RISK IN THE U.S. FINANCIAL SYSTEM* (2020), <https://perma.cc/S7LG-JUM8> [hereinafter CFTC Report].

¹⁴ *Id.* at 14 (citation omitted).

¹⁵ *E.g.*, NEXTERA ENERGY, INC. & FLA. POWER & LIGHT CO., ANNUAL REPORT 2019: FORM 10-K 25 (2020), <https://perma.cc/FY68-BXDT> (indicating that “severe weather and natural disasters . . . can be destructive and cause power outages and property damage [The companies’] physical plants could be placed at greater risk of damage should changes in the global climate produce unusual variations in temperature and weather patterns, resulting in more intense, frequent and extreme weather events, abnormal levels of precipitation and . . . a change in sea level”); *see also, e.g.*, CONSOLIDATED EDISON CO. OF N.Y., INC., 2019 ANNUAL REPORT: FORM 10-K 36 (2020), <https://perma.cc/CQ9B-4V45> (noting that “[c]limate change could affect customer demand for the Companies’ energy services. It might also cause physical damage to the Companies’ facilities and disruption of their operations due to more frequent and more extreme weather-related events”).

¹⁶ *See infra* Part II.C.

remainder of the Article is structured as follows: Part II defines climate resilience planning and details its use in the electric utility sector.¹⁷ Part III explores opportunities to advance climate resilience planning through state utility commission proceedings.¹⁸ It identifies key statutory and common law requirements imposed by public utility law that authorize, and in some cases even compel, state utility commissions to mandate climate resilience planning by electric utilities.¹⁹ Part IV considers whether and when electric utilities that fail to engage in climate resilience planning can be held liable under tort law in state court.²⁰ Part V considers the interplay between the two primary forums identified in Parts III and IV, analyzing legal considerations centered upon choice of forum, including doctrines of primary jurisdiction and exhaustion, and related evidentiary issues.²¹ Part VI concludes with a summary of our key findings.²²

II. CLIMATE RESILIENCE PLANNING IN THE ELECTRIC UTILITY SECTOR

Electric utilities face differing climate risks, partly because of regional differences in the nature and extent of climate-induced weather and environmental changes and, also, partly because of differences in electric utility systems and assets. All electric utilities will, however, be affected by climate change in some way.²³ Across all regions, electric utilities will be faced with higher average and extreme temperatures, changing precipitation patterns, and more intense storms that could force the curtailment or shutdown of generating facilities and lead to widespread transmission and distribution outages.²⁴

The U.S. Department of Energy (DOE) and various other government bodies and private-sector entities (e.g., Moody's) have

¹⁷ See *infra* Part II.

¹⁸ See *infra* Part III.

¹⁹ See *infra* Part III.

²⁰ See *infra* Part IV.

²¹ See *infra* Part V.

²² See *infra* Part VI.

²³ Zamuda et al., *supra* note 1, at 178.

²⁴ *Id.* at 179–83. Numerous other reports have explored how the impacts of climate change will affect different parts of the electric system in different areas. *E.g.*, JAYANT SATHAYE ET AL., ESTIMATING RISK TO CALIFORNIA ENERGY INFRASTRUCTURE FROM PROJECTED CLIMATE CHANGE 9–50 (2011); PETER CAMPBELL JOHNSTON ET AL., ASIAN DEVELOPMENT BANK, CLIMATE RISK AND ADAPTATION IN THE ELECTRIC POWER SECTOR 3–4 (2012), <https://perma.cc/4QD2-5D24>; CLIMATE CHANGE AND THE U.S. ENERGY SECTOR, *supra* note 11, at 1-1; Ariel Miara et al., *Climate and Water Resource Change Impacts and Adaptation Potential for US Power Supply*, 7 NATURE CLIMATE CHANGE 793 (2017), <https://perma.cc/49GB-PETS>; MOLLY HELLMUTH ET AL., ADDRESSING CLIMATE VULNERABILITY FOR POWER SYSTEM RESILIENCE AND ENERGY SECURITY: A FOCUS ON HYDROPOWER RESOURCES 1 (2017), <https://perma.cc/QN9K-Y6UJ>; JUSTIN GUNDLACH & ROMANY WEBB, CLIMATE CHANGE IMPACTS ON THE BULK POWER SYSTEM: ASSESSING VULNERABILITIES AND PLANNING FOR RESILIENCE 3–13 (2018), <https://perma.cc/G2JT-92JS>; Anna M. Brockway & Laurel N. Dunn, *Weathering Adaptation: Grid Infrastructure Planning in a Changing Climate*, CLIMATE RISK MGMT., Nov. 2020, at 5–13.

recommended that electric utilities engage in climate resilience planning to identify vulnerabilities within their systems and develop management options.²⁵ This Part describes the basic steps involved in climate resilience planning and the data required. We also explain how climate resilience planning differs from traditional electric utility planning processes and the benefits it provides. Finally, we survey recent electric utility climate resilience planning efforts and assess their adequacy. Based on that analysis, we conclude that climate risks to electric utility infrastructure can be identified and incorporated into decision-making using well-established, proven planning processes. We observe instances where those processes have been effectively employed by electric utilities but additionally find that the sector generally has often failed to engage in climate resilience planning despite its feasibility and usefulness. That failure has major implications for electric utility customers who are more likely to experience climate-induced service disruptions due to the utility's failure to prepare and will ultimately bear the costs of recovery, which may be significantly higher than the costs of prevention.²⁶ Climate-induced electricity service disruptions can also have broader social consequences. For example, where electricity outages affect critical facilities, such as hospitals or water treatment plants, public health and safety may be threatened.²⁷ Similar threats may also arise due to environmental accidents or other problems triggered by outages. One example occurred during Hurricane Harvey in Texas in 2017, when an electricity outage at an industrial facility led to the release of toxic chemicals into the air.²⁸ More recently, the 2020 blackouts in California,

²⁵ See generally U.S. DEP'T OF ENERGY, CLIMATE CHANGE AND THE ELECTRICITY SECTOR: GUIDE FOR CLIMATE CHANGE RESILIENCE PLANNING 1–2 (2016), <https://perma.cc/JL3U-PH83> [hereinafter 2016 DOE PLANNING GUIDE] (discussing the benefits of resilience planning for electric utilities); see also KRISTIN RALFF-DOUGLAS, CAL. PUB. UTILS. COMM'N, CLIMATE ADAPTATION IN THE ELECTRIC SECTOR: VULNERABILITY ASSESSMENTS & RESILIENCY PLANS 5 (2016), <https://perma.cc/KP55-2TH7> [hereinafter 2016 CPUC REPORT] (discussing Consolidated Edison's 2014 vulnerability assessment); McKinsey & Co., *Confronting Climate Risk*, MCKINSEY QUARTERLY (May 15, 2020), <https://perma.cc/4JAW-8E53> [hereinafter McKinsey & Co., *Confronting*] (discussing integrating climate risk into decision making); *Research Announcement, Moody's U.S. Regulated Electric Utilities Face Varied Exposure to Climate Hazards*, MOODY'S INV'R. SERV. (Jan. 16, 2020), <https://perma.cc/42LZ-YZ7W> (discussing the importance of climate change mitigating measures for electric utilities).

²⁶ SCL CLIMATE VULNERABILITY ASSESSMENT, *supra* note 8, at 1 (noting that “[i]t will be easier and more cost-effective to consider the impacts of climate change in the planning and design of new infrastructure and power resources now than it will be to retrofit infrastructure or replace resources once the impacts of climate change intensify”).

²⁷ See generally Justin Gundlach, *Microgrids and Resilience to Climate-Driven Impacts on Public Health*, 18 HOUS. J. HEALTH L. & POL'Y 77 (2018) (examining how differing policy objectives and definitions coincide with severe electricity outages affecting critical infrastructure and ultimately their customers).

²⁸ Steven Mufson, *Harvey Causes Chemical Companies to Release 1 Million Pounds of Extra Air Pollutants*, THE TEX. TRIB. (Sept. 4, 2017), <https://perma.cc/2AWC-C2T5>; see also Lisa Song et al., *Independent Monitors Found Benzene Levels After Harvey Six Times Higher*

triggered by extreme heat, caused pumps at a wastewater treatment plant to fail, resulting in raw sewage being discharged into nearby waters.²⁹

A. The Basics of Climate Resilience Planning

In the electric utility sector, climate resilience planning is generally conceived of as a two-stage process involving the development of 1) climate vulnerability assessments and 2) climate resilience plans.³⁰ Broadly, climate vulnerability assessments identify where and under what conditions electric utility assets are at risk from the impacts of climate change, how those risks will manifest, and what the consequences will be for system operation.³¹ Based on that information, electric utilities can then develop climate resilience plans, outlining measures to reduce the risk to vulnerable assets.³² Such efforts can take a number of forms but generally involve both measures to prevent or minimize damage to vulnerable assets, e.g., investments in asset hardening³³ or relocation, and to manage the consequences of such damage when it occurs, e.g., investments in system recoverability.³⁴ In developing climate resilience plans, electric utilities compare the costs and impacts of different measures and, based on that information and the risk profile of each asset, determine whether, when, and how to invest.³⁵

Box 1: Guarding Against Maladaptation in Resilience Planning

Maladaptive measures address the symptom of a particular risk while also exacerbating its underlying cause. As the World Bank has noted, in the climate context, maladaptation involves “actions taken that (unintentionally) constrain the options or ability of other decision makers now or in the future to manage the impacts of climate change, thereby resulting in an increase in exposure and/or vulnerability to climate change.”³⁶ Maladaptation also “describes the extent to which adaptation

Than Guidelines, PROPUBLICA (Sept. 14, 2017) <https://perma.cc/36CW-VADH> (discussing environmental advocacy groups independent study after Hurricane Harvey).

²⁹ J.D. Morris, *50,000 Gallons of Sewage Spill into Oakland-Alameda Waters After Power Failure*, S.F. CHRON., <https://perma.cc/E3MQ-E3EU> (last updated Aug. 16, 2020).

³⁰ 2016 DOE PLANNING GUIDE, *supra* note 25, at 1.

³¹ *Id.* at iii.

³² *Id.*

³³ Hardening measures include adding barriers to protect equipment vulnerable to flooding, adding, or improving cooling systems to protect equipment vulnerable to high heat, and reinforcing assets vulnerable to wind damage. *See generally* Zamuda et al., *supra* note 1, at 188–89.

³⁴ While various steps can be taken to lessen the risks posed by climate change, it would be cost prohibitive, and is likely unnecessary to design a system that is completely immune from climate impacts. *See* 2016 CPUC REPORT, *supra* note 25, at 22.

³⁵ *Id.* at 22–26.

³⁶ JANE EBINGER & WALTER VERGARA, CLIMATE IMPACTS ON ENERGY SYSTEMS: KEY ISSUES FOR ENERGY SECTOR ADAPTATION 90 (2011), <https://perma.cc/H889-A37P>. Maladaptation could, for example, occur where electric utilities invest in elevating or

fails or has been conducted in an unsustainable manner.”³⁷ Guarding against maladaptation requires climate resilience planning and investment processes to be designed in a manner that acknowledges the critical importance of reducing greenhouse gas emissions to reduce climate risk.³⁸

In the context of electric utility climate resilience planning, measures to gird against coming climate consequences should be evaluated and implemented in a manner consistent with emission reduction strategies. Thus, for example, electric utilities should consider investments to support distributed renewable energy resource deployment instead of hardening fossil fuel infrastructure. While this Article focuses on the need to assess climate risk and implement climate resilience planning, electric utilities must also make the transition to clean energy a fundamental priority of their resilience efforts.

Previous reports published by DOE and others have outlined recommended best practices for climate resilience planning in the electric utility sector.³⁹ Those reports generally recommend that electric utilities take a long-range, 50-plus year view and plan for the impacts of climate change over the anticipated useful life of existing assets and new assets under development.⁴⁰ Electric utilities should not necessarily limit their review solely to assets they own or operate, particularly where their ability to deliver reliable electricity services depends on facilities owned or operated by third parties. One critical group of assets, which may fall outside electric utilities’ direct control but should nevertheless be

hardening infrastructure against sea level rise in areas where “retreat” is more appropriate. *See generally* Beatriz Azevedo de Almeida & Ali Mostafavi, *Resilience of Infrastructure Systems to Sea-Level Rise in Coastal Areas: Impacts, Adaptation Measures, and Implementation Challenges*, 8 SUSTAINABILITY 1115:1–28, 16 (2016) (finding that “[e]levating vulnerable systems is the most effective adaptation measure to reduce the risk of failure of the electric system. Although being the most effective method, elevation of energy equipment could not be the most cost-effective approach”).

³⁷ Orr Karassin, *Mind the Gap: Knowledge and Need in Regulating Adaptation to Climate Change*, 22 GEO. INT’L ENV’T L. REV. 383, 389 n.31 (2010).

³⁸ EBINGER & VERGARA, *supra* note 36, at xxix–xxxi. Notably reducing greenhouse gas emissions continues to be the best approach to preventing future damage. Alice Hill & Leonardo Martinez-Diaz, *Adapt or Perish: Preparing for the Inescapable Effects of Climate Change*, FOREIGN AFF. (Jan./Feb. 2020), <https://perma.cc/A7EN-HAXX>. For a discussion of how mitigation efforts should be informed by adaptation benefits, see Lesley K. McAllister, *Adaptive Mitigation in the Electric Power Sector*, 2011 BYU L. REV. 2115, 2120–23 (2011).

³⁹ *E.g.*, 2016 DOE PLANNING GUIDE, *supra* note 25, at iii; *e.g.*, U.S. DEP’T OF ENERGY, CLIMATE CHANGE AND THE ELECTRICITY SECTOR: GUIDE FOR ASSESSING VULNERABILITIES AND DEVELOPING RESILIENCE SOLUTIONS TO SEA LEVEL RISE, v (2016), <https://perma.cc/7EC3-KWRT>; ASIAN DEVELOPMENT BANK, GUIDELINES FOR CLIMATE PROOFING INVESTMENT IN THE ENERGY SECTOR, xvi (2013), <https://perma.cc/J7ND-3MUT>; 2016 CPUC REPORT, *supra* note 25, at 2; MELISSA ALLEN ET AL., OAK RIDGE NAT’L LAB’Y, ASSESSING THE COSTS AND BENEFITS OF RESILIENCE INVESTMENTS: TENNESSEE VALLEY AUTHORITY CASE STUDY, ix (2017), <https://perma.cc/DJC9-NJMN>; GUNDLACH & WEBB, *supra* note 24, at i–ii.

⁴⁰ 2016 DOE PLANNING GUIDE, *supra* note 25, at 44, 80, 83.

considered, is generation. In this regard, the California Public Utilities Commission (CPUC) has noted that in states with deregulated electricity markets “utilities no longer own all the generation assets and rely on independent power producers and merchant generators for a significant amount of power. These assets should be considered part of any evaluation of vulnerabilities in the same way the [utilities] assess their own assets.”⁴¹

Electric utilities should consider the full range of climate impacts expected to occur within their respective service territories during the planning period. This necessarily requires the use of forward-looking projections because, in the age of climate change, historic data is no longer a good predictor of future conditions.⁴² Since the impacts of climate change will vary regionally, electric utilities should use localized or downscaled projections, which reflect anticipated conditions in the planning area.⁴³ Based on those projections electric utilities can evaluate how different climate outcomes may affect their systems and identify key vulnerabilities that may need to be addressed.⁴⁴ Electric utilities will often benefit from engaging outside consultants or partnering with academic researchers who can assist in developing and interpreting downscaled climate projections and work with the utility’s in-house engineering team to evaluate system impacts.

Box 2: Projecting Climate Impacts

The extent of future climate change will depend largely on the amount of future greenhouse gas emissions.⁴⁵ Global climate models (GCMs), which mathematically simulate key aspects of the Earth’s climate, are used to project likely outcomes based on different emissions scenarios.⁴⁶ While the spatial resolution of GCMs has increased over time, most still use grid cells that extend sixty miles or more on one side, resulting in coarse-resolution projections that are ill suited for use in climate resilience

⁴¹ 2016 CPUC REPORT, *supra* note 25, at 17.

⁴² U.S. DEP’T OF ENERGY, A REVIEW OF CLIMATE CHANGE VULNERABILITY ASSESSMENTS: CURRENT PRACTICES AND LESSONS LEARNED FROM DOE’S *PARTNERSHIP FOR ENERGY SECTOR CLIMATE RESILIENCE* 12 (2016), <https://perma.cc/ZV3Z-ZABD> [hereinafter 2016 DOE PARTNERSHIP REPORT].

⁴³ 2016 DOE PLANNING GUIDE, *supra* note 25, at 17; 2016 CPUC REPORT, *supra* note 25, at 9. *See infra* Part II.A Box 2.

⁴⁴ The assessment of impacts builds on, but is distinct from, the assessment of future climate conditions. The latter focuses on how key climate variables (e.g., temperature, precipitation, etc.) are likely to change in the future and the associated shifts in environmental conditions (e.g., sea level rise). That involves a different analysis from the assessment of how future climate and environmental conditions will impact electric assets and systems. *See generally* 2016 DOE PLANNING GUIDE, *supra* note 25, at 31 & 42. For an example vulnerability assessment, *see* CONSOLIDATED EDISON, CLIMATE CHANGE VULNERABILITY STUDY 17 (2019), <https://perma.cc/4NNW-76A2>.

⁴⁵ K. Hayhoe et al., *Climate Models, Scenarios, and Projections*, in 1 CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT 133, 134 (D.J. Wuebbles et al., eds., 2017), <https://perma.cc/R5FW-6AYC>.

⁴⁶ *Id.* at 141–42.

planning.⁴⁷ Downscaling techniques can, however, be used to process and refine GCM projections to estimate climate impacts at finer geographic scales that are more useful for climate resilience planning.⁴⁸

The availability of downscaled data has increased significantly in recent years.⁴⁹ It can now be found in various publicly available tools and reports developed by government, academic, and other independent bodies.⁵⁰ One example is the web-based Cal-Adapt tool, which was developed by researchers at the University of California, Berkeley with funding from the California Energy Commission and California Strategic Growth Council.⁵¹ The tool includes projections for key climate variables, such as temperature and precipitation, at 3.7 square-mile increments.⁵² Other sources include even more granular data, with spatial scales below 2.5 miles, and even as fine as 0.6 miles.⁵³

⁴⁷ CONSOLIDATED EDISON, CLIMATE CHANGE VULNERABILITY STUDY 17 (2019), <https://perma.cc/QP5U-6SA7>. The spatial resolution of GCMs is improving. The latest, experimental models can project key climate parameters (e.g., temperature and precipitation) in 15-to-30-mile increments. Even this may, however, be too coarse for use in climate resilience planning. See Hayhoe et al., *supra* note 45, at 141 (“[T]he latest experimental high-resolution simulations, at 15–30 miles (25–50 km) per gridbox, are unable to simulate all of the important fine-scale processes occurring at regional to local scales.”).

⁴⁸ Hayhoe et al., *supra* note 45, at 141. For a discussion of downscaling techniques, see *Id.* at 145–46; SYLWIA TRZASKA & EMILIE SCHNARR, CTR. FOR INT’L EARTH SCI. INFO. NETWORK, A REVIEW OF DOWNSCALING METHODS FOR CLIMATE CHANGE PROJECTIONS (2014), <https://perma.cc/W3CT-YGE2>.

⁴⁹ Joseph J. Barsugli et al., *The Practitioner’s Dilemma: How to Assess the Credibility of Downscaled Climate Projections*, 94 EOS 424, 424 (2013).

⁵⁰ See, e.g., *Energy Data Gallery*, U.S. CLIMATE RESILIENCE TOOLKIT, <https://perma.cc/JC79-3VQR> (last modified Sept. 24, 2019) (providing a gallery of climate-relevant data sources from the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration (NASA), and the DOE); see also, e.g., NASA CTR. FOR CLIMATE SIMULATION, *NASA Earth Exchange (NEX) Downscaled Climate Projections (NEX-DCP30)*, <https://perma.cc/MYS7-6VQ3> (last visited Mar. 22, 2021) (providing a dataset comprised of downscaled climate scenarios for the conterminous United States); *Regional Climate Change Viewer*, U.S. GEOLOGICAL SURV., <https://perma.cc/33GP-QGR2> (last visited Mar. 22, 2021) (“The Regional Climate Change Viewer (RCCV) allows a user to visualize model output projections from the Dynamical Downscaling project.”); *Downscaled CMIP3 and CMIP5 Climate and Hydrology Projections*, BUREAU OF RECLAMATION ET AL., <https://perma.cc/Q5TW-S79A> (last visited Mar. 22, 2021) (providing an archive of “fine spatial resolution translations of climate projections”); *Adapt West – A Climate Adaptation Conservation Planning Database for North America*, ADAPTWEST, <https://perma.cc/DU4M-F2X2> (last visited Mar. 22, 2021) (providing “a spatial database designed to help . . . organizations implement strategies that promote resilience, protect biodiversity, and conserve and enhance the adaptation potential of natural systems”).

⁵¹ *About Cal-Adapt*, CAL-ADAPT, <https://perma.cc/XJB6-LUJV> (last visited Mar. 22, 2021). For more information about Cal-Adapt, see Susan Wilhelm, Cal. Energy Comm’n, Presentation at IEPR Workshop on Adaptation and Resilience for the Energy System: Unveiling Cal-Adapt 2.0: Facilitating Energy Sector Resilience and Providing Foundational Scenarios for California’s Fourth Climate Change Assessment (Aug. 29, 2017) (slides available at <https://perma.cc/65P4-H4A7>).

⁵² *Maps of Projected Change*, CAL-ADAPT, <https://perma.cc/E58A-328U> (last visited Mar. 22, 2021).

⁵³ Hayhoe et al., *supra* note 45, at 144.

Given the uncertainty regarding future emission levels and associated climate impacts, it is often recommended that electric utilities adopt a “bounded parameters” approach, comparing asset vulnerabilities and resilience solutions under best- and worst-case scenarios.⁵⁴ That approach can, however, be difficult to implement because projected outcomes often differ widely between scenarios.⁵⁵ For example, a 2014 DOE study of climate risks to energy infrastructure found that by the 2070s, i.e., within the useful life of some assets deployed this decade,⁵⁶ New York City could experience anywhere from one to four feet of sea level rise.⁵⁷ Planning for such a wide range of possible outcomes presents significant challenges for electric utilities as relatively low probability outcomes could have catastrophic impacts. Consider, for instance, how existing assets would be affected under the different sea level-rise scenarios in the DOE study. With one foot of sea level rise, only one large existing electric system asset⁵⁸ would be inundated, whereas nine would be inundated at the high end.⁵⁹ Should electric utilities invest in measures to protect all nine potentially affected assets or only a subset? Should electric utilities design new assets to withstand a full four feet of sea level rise or only a smaller amount? Should electric utilities delay making these decisions until greater certainty exists?

Electric utilities’ answers to these and similar questions will necessarily depend on their own risk tolerances—i.e., the level of risk they are willing to accept—and those of their customers, regulators, and other stakeholders. Where risk tolerances differ, conflicts could arise. It is important to recognize that, “[w]hile the appropriate risk tolerance may be debated . . . all electricity systems will present some level of risk” as service disruptions and outages can never be completely eliminated.⁶⁰

One tool that may aid electric utilities and other stakeholders in evaluating risk is probabilistic modeling. Broadly, probabilistic climate projections incorporate probability distributions for each climate parameter and thus provide an indication of the likelihood of different

⁵⁴ See, e.g., 2016 DOE PLANNING GUIDE, *supra* note 25, at 19 (explaining that the “bounded parameters” approach includes “completing a vulnerabilities assessment using multiple climate scenarios to establish a range of potential outcomes for climate parameters such as average temperature, precipitation, and sea level rise”).

⁵⁵ 2016 CPUC REPORT, *supra* note 25, at 8–9.

⁵⁶ Many electric system assets have useful lives of 50 years or more. Zamuda et al., *supra* note 1, at 192.

⁵⁷ OFF. OF ELEC. DELIVERY & ENERGY RELIABILITY, U.S. DEP’T OF ENERGY, EFFECT OF SEA LEVEL RISE ON ENERGY INFRASTRUCTURE IN FOUR MAJOR METROPOLITAN AREAS 15 (2014), <https://perma.cc/H3K8-T7TQ>.

⁵⁸ The DOE study defined large assets to mean power plants of 100-megawatt capacity or greater and substations of 230 kilovolts or greater. *Id.* at 16.

⁵⁹ *Id.* at 17–18.

⁶⁰ Romany Webb, *Ensuring Electricity System Resilience in the Face of Climate Change: Report of a Workshop Co-Hosted by the Sabin Center for Climate Change Law*, CLIMATE L. BLOG (Apr. 17, 2019), <https://perma.cc/C72H-BUCG>.

climate outcomes.⁶¹ As such, probabilistic projections enable electric utilities to make a more informed assessment of where and how individual assets will be impacted, and the most appropriate resilience investments.⁶² Recognizing these benefits, DOE has supported research to develop downscaled, probabilistic climate projections.⁶³ Such projections are now publicly available for key climate parameters, e.g., temperature and precipitation, in many areas,⁶⁴ but custom modeling may be required in some cases.⁶⁵ Recent advances in modeling techniques have made it easier for electric utilities and others to obtain customized projections, incorporating detail at spatial and temporal scales that align with those used in the planning process.⁶⁶

After securing the necessary data, electric utilities can evaluate the risk to their assets by comparing anticipated future climate and environmental conditions to existing asset characteristics, e.g., location, and design and operating parameters.⁶⁷ Electric utilities should assign a risk profile to each asset, based on the likelihood and consequences of it being impacted, and use that to prioritize vulnerabilities and resilience measures.⁶⁸ A range of measures, with varying risk mitigation potential, may be available for each vulnerability.⁶⁹ In developing their resilience plans, electric utilities must compare the available measures to determine whether and when to invest.⁷⁰ In other contexts, electric utilities typically base their investment decisions on cost-benefit analysis (CBA), but this can be difficult to apply to resilience projects when, for

⁶¹ 2016 DOE PLANNING GUIDE, *supra* note 25, at 19; *see also* A. Barrie Pittock et al., *Probabilities Will Help Us Plan for Climate Change*, 413 NATURE 249 (2001) (arguing that “probability estimates are needed” for effective planning and that, without them, “planners will be left needing to . . . hedge their bets, delay their decisions, or else gamble on whether humanity will go down high or low emissions development pathways as they adapt design standards and zoning to climate change”).

⁶² 2016 DOE PLANNING GUIDE, *supra* note 25, at 19.

⁶³ *Id.* at 19 n.b. DOE has partnered with the NASA and the NOAA to make available climate data specifically tailored for use in electric resilience planning. *Energy Data Gallery*, *supra* note 50.

⁶⁴ *See, e.g.*, Liang Ning et al., *Probabilistic Projections of Climate Change for the Mid-Atlantic Region of the United States: Validation of Precipitation Downscaling During the Historical Era*, 25 J. CLIMATE 509, 510 (2012) (providing a probabilistic framework for the temperature and precipitation change over the mid-Atlantic and Northeast regions of the United States); *see also, e.g.*, David W. Pierce et al., *Probabilistic Estimates of Future Changes in California Temperature and Precipitation Using Statistical and Dynamical Downscaling*, 40 CLIMATE DYNAMICS 839, 840 (2013) (providing a probabilistic framework for the temperature and precipitation change over California by the 2060s).

⁶⁵ 2016 DOE PLANNING GUIDE, *supra* note 25, at 19.

⁶⁶ *See* Ning et al., *supra* note 64 (explaining new methods for local-scale climate projections).

⁶⁷ *See* 2016 DOE PLANNING GUIDE, *supra* note 25, at 31–35 (noting that the “thresholds are simply values above or below which the likelihood of a climate impact” may cause vulnerability to an asset or operation).

⁶⁸ *Id.* at 54–59.

⁶⁹ For a discussion of potential resilience measures, *see id.* at 61–64.

⁷⁰ *Id.* at 77.

instance, key benefits are unknown or difficult to quantify.⁷¹ Additional evaluation tools may, therefore, be needed.⁷²

It is often recommended that electric utilities, after evaluating possible resilience measures, develop “flexible adaptation pathways” to guide their implementation.⁷³ The flexible pathways approach is intended to assist electric utilities to manage the uncertainties inherent in climate change.⁷⁴ Under this approach, electric utilities are encouraged to implement no- and low-regrets resilience measures immediately and establish thresholds or trigger points for the taking of other actions.⁷⁵ The thresholds are based on pre-determined risk levels that, if left unaddressed, would result in severe impacts and potentially irreversible consequences.⁷⁶ In assessing risk, electric utilities should consider not only the vulnerability of individual assets to climate impacts but also the asset’s importance to system operation and reliability. Electric utilities may be justified in incurring larger costs to enhance the resilience of critical assets, the loss of which could result in widespread or prolonged outages, or pose serious risks to public health or the environment.

Box 3: Tools for Evaluating Resilience Measures

CBA is widely used, both within and outside the electric utility sector, to assess the financial viability of projects that have large upfront costs but deliver benefits over many years.⁷⁷ The process is conceptually simple—a project’s benefits and costs are expressed in monetary terms, discounted to present value, and then compared.⁷⁸ Few issues arise when costs and benefits are known and easily quantifiable. However, that is often not the case for climate resilience measures, the benefits of which will depend (at least in part) on future climate outcomes, which are uncertain. Any assumptions made will invariably affect the results of the

⁷¹ *Id.* at 77–80; see also Craig D. Zamuda et al., *Monetization Methods for Evaluating Investments in Electricity System Resilience to Extreme Weather and Climate Change*, ELEC. J., Nov. 2019, at 106641:1, 2 [hereinafter Zamuda et al., *Monetization*] (providing that “the benefits of investments in power system resilience may be more difficult to monetize and to include within a formal cost-benefit analysis framework”).

⁷² See *infra* Part II.A. Box 3.

⁷³ JUDSEN BRUZGUL ET AL., RISING SEAS AND ELECTRICITY INFRASTRUCTURE: POTENTIAL IMPACTS AND ADAPTATION OPTIONS FOR SAN DIEGO GAS AND ELECTRIC (SDG&E) 17–18 (2018), <https://perma.cc/XTQ8-2VAV>.

⁷⁴ *Id.* at 17.

⁷⁵ *Id.* at 18. No regrets measures are ones that can be taken now, despite uncertainty about future climate change, and will deliver benefits regardless of future conditions. 2016 DOE PLANNING GUIDE, *supra* note 25, at 65.

⁷⁶ BRUZGUL ET AL., *supra* note 73, at 18.

⁷⁷ 2016 DOE PLANNING GUIDE, *supra* note 25, at 79; see also Kathy Castle, *Cost Benefit Analysis Example and Steps (CBA Example)*, PROJECTCUBICLE (Feb. 13, 2018), <https://perma.cc/6TFW-8QCP> (stating that CBA is widely used in finance and economics and listing a few examples, including software development, construction, education, healthcare, and information technology).

⁷⁸ Castle, *supra* note 77 (explaining that net present value is used to compare present costs and future benefits on equal terms).

CBA. Thus, when using CBA, electric utilities should conduct sensitivity analysis to assess how changing the assumptions would affect the results.⁷⁹

CBA also inevitably involves difficult decisions about which costs and benefits should be counted.⁸⁰ In the electric utility sector, the primary focus is typically on costs and benefits that accrue to the electric utility company and its customers, with little or no attention paid to broader societal impacts.⁸¹ This can create difficulties when applying CBA to investments in climate resilience because, while the costs of such measures are imposed on electric utility companies and their customers today, the benefits are often more widely dispersed both geographically and temporally.⁸²

Given the above, electric utilities and the state utility commissions that regulate them should look at using other tools to evaluate resilience measures. One option is breakeven analysis, which begins by estimating the value to customers of avoiding electricity outages⁸³ and then calculates how many outages would need to be mitigated by a resilience measure for customers to realize sufficient value to justify investing in that measure.⁸⁴ This can then be compared to the probability of future climate-related outages to assess the expected benefits of investment.

Resilience measures can also be evaluated under the so-called “robust decision making” or “RDM” framework.⁸⁵ Under this approach, measures are assessed under a wide range of possible future outcomes to determine which will perform best in a range of circumstances.⁸⁶

⁷⁹ Sensitivity analysis shows the relative importance of different inputs into the CBA and thus can be used to determine how varying each input would alter the result. 2016 DOE PLANNING GUIDE, *supra* note 25, at 80.

⁸⁰ Zamuda et al., *Monetization*, *supra* note 71, at 1.

⁸¹ *See id.* at 1–2 (noting that despite the high costs of severe weather, prior to investing utilities often must make a strong case about societal benefits of resilience, which are hard to accurately value).

⁸² *See id.* at 1–2, 4 (describing benefits of resilience, including preventing legal liabilities, revenue loss, property damage, aesthetic damage, and emissions).

⁸³ This is often referred to as the value of lost load (VOLL). Previous studies have estimated the VOLL for different classes of electric utility customers. *See, e.g.*, MICHAEL J. SULLIVAN ET AL., ESTIMATED VALUE OF SERVICE RELIABILITY FOR ELECTRIC UTILITY CUSTOMERS IN THE UNITED STATES (2009), <https://perma.cc/2E7W-V7MW> (describing the methodology and estimating damages for commercial, industrial, and residential class customers); *see also, e.g.*, MICHAEL J. SULLIVAN ET AL., UPDATED VALUE OF SERVICE RELIABILITY ESTIMATES FOR ELECTRIC UTILITY CUSTOMERS IN THE UNITED STATES (2015), <https://perma.cc/YW37-RFA6> (reanalyzing and comparing the findings in the 2009 study with the results from the 2014 study).

⁸⁴ William P. Zarakas et al., *Utility Investments in Resiliency: Balancing Benefits with Cost in an Uncertain Environment*, *ELEC. J.*, June 2014, at 31, 35–36, 38.

⁸⁵ *See* Robert J. Lempert, *Embedding (Some) Benefit-Cost Concepts into Decision Support Processes with Deep Uncertainty*, 5 *J. BENEFIT-COST ANAL. (SPECIAL ISSUE)* 487, 491, 504–05 (2014) (describing what, how, and why RDM is used and analyzing its advantages and disadvantages over traditional CBA).

⁸⁶ *Id.* at 493–95, 498, 504–09.

B. The Importance of Climate Resilience Planning

Climate resilience planning differs from, but complements, other planning processes commonly employed by electric utilities.⁸⁷ Consider, for example, the integrated resource plans (IRPs) that many utilities develop to evaluate supply- and demand-side options for meeting future electricity needs.⁸⁸ While IRPs vary, most employ a twenty-year planning horizon,⁸⁹ which is shorter than that recommended for climate resilience planning.⁹⁰ Moreover, whereas climate resilience planning relies on forward-looking projections,⁹¹ IRPs are frequently based on historic data.⁹² The load forecasts used in IRPs typically assume a continuation of historic weather patterns and thus do not accurately account for anticipated future temperature increases and other climate impacts that could affect electricity demand.⁹³ In evaluating options to meet demand, electric utilities generally do not consider their relative vulnerability to climate impacts or possible resilience enhancements.⁹⁴ Climate resilience planning addresses these vulnerabilities, providing additional information that can be used to update load forecasts and compare resource options, thus enabling electric utilities to make more informed investment decisions.

Climate resilience planning is also important to supplement the disaster or emergency response planning currently undertaken by electric utilities. Broadly, disaster or emergency response planning focuses on electric utilities' preparedness for one-off weather-related or other events, e.g., cyber-attacks, which could lead to service interruptions or safety issues.⁹⁵ Such planning is typically based on historic data, reflecting the incidence and severity of past events, and focuses on short-term measures

⁸⁷ Compare 2016 DOE PARTNERSHIP REPORT, *supra* note 42 (describing the risks of solely relying on historical data), with Brockway & Dunn, *supra* note 24, at 21–22 (describing the use of historical data to predict temperature and weather changes).

⁸⁸ As of May 2020, 36 states required electric utilities to file IRPs, or equivalent documents. Coley Girouard, *Understanding IRPs: How Utilities Plan for the Future*, ADVANCED ENERGY ECON. (Aug. 11, 2015), <https://perma.cc/5VPL-2PQX>.

⁸⁹ *Id.*

⁹⁰ As discussed previously, it is recommended that climate resilience planning take a longer-term view and consider climate impacts over the expected useful life of electric system assets, which can be fifty years or more. *See supra* notes 39–40 and accompanying text.

⁹¹ *See supra* Part II.A.

⁹² *See* Brockway & Dunn, *supra* note 24, at 21–22.

⁹³ There are some exceptions. For example, the California Energy Commission publishes load forecasts which are developed based on historic weather data, but then adjusted to account for anticipated future temperature increases. Other climate impacts are not, however, accounted for. *Id.* at 3.

⁹⁴ Again, there are some exceptions. For example, Tennessee Valley Authority has previously considered resilience measures in its IRPs. ALLEN ET AL., *supra* note 39.

⁹⁵ *See* AM. PUB. POWER ASS'N, ALL-HAZARDS GUIDEBOOK 9 (2018), <https://perma.cc/4Z3H-FESR> (noting that public power providers must evaluate the risks of natural disasters, as well as new hazards, such as cybersecurity threats).

to prepare and respond.⁹⁶ While short-term preparedness is certainly important, it is not sufficient to address the risks posed by climate change, which requires a broader future-focused approach.⁹⁷

Integrating climate considerations into current planning and investment decisions should benefit both electric utilities and their customers. Identifying and reducing climate-related threats to existing assets may require material investments in hardening and relocation—projects that typically have long-lead times and must therefore be planned now to avoid future reliability issues.⁹⁸ Advanced planning can also improve investment decision-making, ensuring that electric utilities act prudently and that their capital expenditures benefit ratepayers. Electric utilities must also plan for the impacts of climate change on new assets, many of which will remain in operation for several decades when climate impacts will become increasingly severe.⁹⁹ Considering those impacts now enables electric utilities to build in resilience, thereby lessening the need for costly retrofits in the future, as well as the potential for future outages.¹⁰⁰ Thus, while climate resilience planning may require up-front investments, it should result in lifetime savings for electric utilities and their customers, including avoided storm damage and recovery costs.

Failing to plan for the impacts of climate change could also increase electric utilities' costs in other ways.¹⁰¹ For example, electric utilities that fail to design new infrastructure with climate impacts in mind may face higher borrowing and insurance costs as concern grows within the financial community about the impacts of climate change on electric utility infrastructure and business models.¹⁰²

⁹⁶ *Id.* at 10–11.

⁹⁷ The same is also likely true of cyber-attacks. Technological advances as well as other advances mean that past experience with cyber-attacks may not be a good predictor of future events.

⁹⁸ Webb, *supra* note 60.

⁹⁹ SCL CLIMATE VULNERABILITY ASSESSMENT, *supra* note 8, at 1 (recognizing that “[d]ecisions are being made today that will shape the resources and infrastructure of the utility for decades into the future when the impacts of climate change will intensify”).

¹⁰⁰ *Id.* (concluding that “[i]t will be easier and more cost-effective to consider the impacts of climate change in the planning and design of new infrastructure and power resources now than it will be to retrofit infrastructure or replace resources once the impacts of climate change intensify”).

¹⁰¹ See Juhyun Jong et al., *Carbon Risk, Carbon Risk Awareness and the Cost of Debt Financing*, 150 J. BUS. ETHICS 1151, 1151, 1153, 1155 (2018) (finding that failing to account for climate risk could increase costs of borrowing and insurance).

¹⁰² See *id.* at 1151 (finding an “economically meaningful” “positive association between cost of debt and carbon risk”). As discussed further below, electric utilities that fail to plan for climate impacts also risk being denied cost recovery for their capital investments under the prudence standard. See *infra* Part III.A.1.

Box 4: The Consequences of Failing to Plan for Climate Impacts

Recent electricity outages in California provide a preview of what might become the “new normal” if climate considerations are not integrated into electric system planning.¹⁰³ On August 14 and 15, 2020, the California Independent System Operator (CAISO)—the entity that manages much of California’s electric grid—ordered electric utilities in the state to initiate temporary rolling service cuts due to a shortage of electricity supplies.¹⁰⁴ As a result, over 800,000 customers lost electricity, some for up to two hours.¹⁰⁵

A preliminary analysis of the incident, conducted by the CAISO, the CPUC, and the California Energy Commission, concluded that “[t]he climate change-induced extreme heat storm across the western United States resulted in demand for electricity exceeding the existing electricity resource planning targets.”¹⁰⁶ The analysis further found that existing resource planning processes do not adequately account for extreme heat and other climate-induced changes.¹⁰⁷ For example, the electricity demand forecasts used to develop resource adequacy requirements are based on average historic peak demand, reflecting one-in-two year conditions.¹⁰⁸ A fifteen percent “planning reserve margin” is added to that amount to, among other things, account for demand spikes.¹⁰⁹ However, even that was not sufficient to account for the impact of the August 2020 heat wave, which reflected what was considered to be a one-in-thirty year event.¹¹⁰ As climate change accelerates, such events will occur more frequently and thus must be factored into planning processes so as to minimize the risk of supply shortages and associated outages.

C. Extent of Climate Resilience Planning in the Electric Utility Sector

Despite the benefits of climate resilience planning, relatively few electric utilities have engaged in the process, with many citing the uncertainties inherent in climate change and the challenges associated with studying it as reasons not to act.¹¹¹ Where climate resilience planning has occurred, electric utilities have often been forced into action by particularly severe extreme weather events, which highlighted

¹⁰³ *Are California’s Planned Power Outages a Sign of the New Normal?*, ENEL X, <https://perma.cc/N6PU-TEPQ> (last visited Mar. 23, 2021).

¹⁰⁴ CAL. INDEP. SYS. OPERATOR ET AL., PRELIMINARY ROOT CAUSE ANALYSIS: MID-AUGUST 2020 HEAT STORM 2–3 (2020), <https://perma.cc/6MMD-K7YT>.

¹⁰⁵ *Id.* at 42.

¹⁰⁶ *Id.* at 43.

¹⁰⁷ *Id.* at 43–44.

¹⁰⁸ One-in-two-year conditions represent a 50 percent probability that actual peak demand will be either higher or lower than forecasted. *Id.* at 2, 18.

¹⁰⁹ *Id.* at 18.

¹¹⁰ CAL. INDEP. SYS. OPERATOR ET AL., FINAL ROOT CAUSE ANALYSIS: MID-AUGUST 2020 EXTREME HEAT WAVE 4 (2021), <https://perma.cc/S7W7-8SS2>.

¹¹¹ See *infra* Part II.C Box 5 (outlining proposed explanations for electric utilities’ reluctance to engage in climate resilience planning).

vulnerabilities within their systems. For example, after Hurricanes Katrina and Rita caused widespread damage to its transmission and distribution systems in 2005, Entergy Corporation instituted a program to study climate risks and develop resilience measures.¹¹² Consolidated Edison Company of New York, Inc. (Con Ed) did the same following Superstorm Sandy in 2013.¹¹³ As discussed further below, Con Ed’s “Climate Change Vulnerability Study” (Con Ed Climate Study) was particularly comprehensive, using custom downscaled projections to analyze five climate variables over seven time periods from 2020 through 2080.¹¹⁴ In accordance with recommended best practice, Con Ed took a probabilistic approach, under which it analyzed the likelihood and consequences of a range of plausible climate outcomes.¹¹⁵ This enabled Con Ed to identify key vulnerabilities within its system and design flexible resilience pathways to manage those vulnerabilities.¹¹⁶

Box 5: Why Have So Few Electric Utilities Engaged in Climate Resilience Planning?

Various explanations have been offered for electric utilities’ reluctance to engage in climate resilience planning. The Fourth National Climate Assessment identified “[t]he inability to predict future climate parameters with complete accuracy” as a key factor discouraging climate resilience planning.¹¹⁷ While electric utilities regularly deal with uncertainty in other contexts, e.g., when planning for projected changes in electricity load,¹¹⁸ climate change is often perceived as involving greater unknowns.¹¹⁹ Many electric utilities appear to view climate resilience planning as akin to an exercise in conjecture. For example, in May 2016, NextEra Energy—the parent company of Florida Power and Light—opposed a shareholder proposal to require the electric utility to report annually on its vulnerability to sea level rise by saying: “a proposal that asks the company to speculate on a single aspect of global climate change nearly a century into the future would be a waste of time and money.”¹²⁰

¹¹² Gloria Gonzalez, *Entergy Seeks to Lead on Climate Risk Mitigation*, GREENBIZ (Aug. 14, 2013), <https://perma.cc/7W7V-DDV3>. Entergy Corporation documented the findings of its study in a series of reports. *E.g.*, ENTERGY CORPORATION ET AL., EFFECTIVELY ADDRESSING CLIMATE RISK THROUGH ADAPTATION FOR THE ENERGY GULF COAST (2010), <https://perma.cc/8T5Q-A885>; ENTERGY CORPORATION ET AL., BUILDING A RESILIENT ENERGY GULF COAST: EXECUTIVE REPORT (Undated), <https://perma.cc/EUE3-57KY>.

¹¹³ CONSOLIDATED EDISON, *supra* note 47, at 1.

¹¹⁴ *See id.* at 1, 3–4 (summarizing the study design).

¹¹⁵ *Id.* at 12–15.

¹¹⁶ *Id.* at 32–49, 57–61.

¹¹⁷ Zamuda et al., *supra* note 1, at 192.

¹¹⁸ U.S. ENERGY INFO. ADMIN., SHORT-TERM ENERGY OUTLOOK (March 9, 2021), <https://perma.cc/QT3N-DW6Q>.

¹¹⁹ Zamuda et al., *supra* note 1, at 192.

¹²⁰ Mary Ellen Klas, *Shareholders of FPL’s Parent Company Reject Climate Change Report*, MIAMI HERALD (May 19, 2016), <https://perma.cc/G35X-RTAN>.

Other electric utilities have cited limited data availability as a hindrance to climate resilience planning. For example, some utilities participating in DOE's Resilience Partnership complained of a "disconnect between the granularity of the outputs of climate modeling and the types of temperature projections utility planners need."¹²¹ Recent improvements in climate modeling and downscaling techniques have helped to mitigate this problem.¹²² Still, electric utilities often have to engage consultants or other researchers to develop localized climate data that meets their needs, which can be costly.¹²³ Even larger costs are associated with measures to harden or otherwise enhance the resilience of electric utility assets.

This raises another set of questions for electric utilities considering engaging in climate resilience planning: will they be permitted to recover the potentially significant costs incurred in the planning process? And, even more important: will they be permitted to recover the much larger costs associated with implementing resilience measures that planning demonstrates are advisable? Due to electric utilities' status as monopoly service providers, and the essential nature of the service they provide, their rates are strictly regulated by state utility commissions.¹²⁴ While regulation varies between states, the basic goal of all commissions is to ensure "fair, just, and reasonable" rates, which enable electric utilities to recover no more than their prudently incurred costs plus a reasonable return on prudent investments.¹²⁵ Many state utility commissions are yet to rule on whether electric utilities will be permitted to recover the costs associated with climate resilience planning and investment and if so, when. The resulting uncertainty may have discouraged some electric utilities from engaging in the planning process.¹²⁶ Seeming to confirm this, the Con Ed Climate Study was delayed for several years, in part, due to uncertainty regarding whether the New York Public Service

¹²¹ 2016 DOE PARTNERSHIP REPORT, *supra* note 42, at 24; *see also id.* at 27 (noting that utilities participating in the Resilience Partnership "identified multiple data that are necessary for effective resilience planning but currently unavailable," such as "downscaled climate model data for projected changes in future climate," and that "[i]n general, Partners found the spatial and temporal resolution of current climate models lacking"); CRAIG ZAMUDA ET AL., ELECTRICITY SECTOR RESILIENCE STRATEGIES: CURRENT PRACTICES AND LESSONS LEARNED FOR EXTREME WEATHER 6, 24 (2019) [hereinafter ZAMUDA ET AL., ELECTRICITY] (noting challenges and gaps needed to improve resilience planning).

¹²² *See supra* Part II.A Box 2.

¹²³ ZAMUDA ET AL., ELECTRICITY, *supra* note 121, at 11.

¹²⁴ REGUL. ASSISTANCE PROJECT, ELECTRICITY REGULATION IN THE US: A GUIDE 3 (2011), <https://perma.cc/G5L3-Q46Z>.

¹²⁵ *Id.* at 31, 38.

¹²⁶ *See* Heather N. Jarvis, *Keeping the Lights on—At All Costs? Imploring Consistent Prudence Review and a Prudence Standard that Includes Demand Response and Responsible Portfolio Management*, 29 VT. L. REV. 1037, 1040–41 (2005) (concluding that electric utilities are often reluctant "to take risks for fear of not being able to recapture expenditures" and citing, as an example, utilities' avoiding investment in new generation assets because of "regulatory uncertainty" arising from a "perceived . . . breakdown in the 'regulatory compact' under which utilities had come to believe they were entitled to recover fully all of their utility investments").

Commission (NYPSC) would allow Con Ed to recover the associated costs.¹²⁷ This may be even more of a concern for electric utilities operating in states where the utility commission has not historically acted on climate-related issues or there is political resistance to addressing or even discussing the issue.

The Con Ed Climate Study is widely regarded as the gold standard for climate resilience planning in the electric utility sector.¹²⁸ The studies conducted by other electric utilities have generally been more limited: often focusing solely or primarily on event-based climate impacts, e.g., storms or wildfires,¹²⁹ and ignoring more gradual changes, e.g., temperature and sea level rise;¹³⁰ considering climate impacts on only a subset of their assets, rather than the system as a whole;¹³¹ or assessing asset vulnerabilities based only on historic weather data¹³² or very limited climate projections, e.g., a single “worst case” outcome.¹³³

These and other flaws were identified in several of the climate vulnerability assessments prepared by electric utilities as part of DOE’s Partnership for Energy Sector Climate Resilience (Resilience Partnership).¹³⁴ Established in April 2015 in response to industry requests for additional guidance on climate resilience planning, the Resilience Partnership was intended to provide a forum for electric utilities to exchange information and compare best practices.¹³⁵ As part of the Resilience Partnership, seventeen electric utilities, serving approximately twenty-five percent of electricity customers in the U.S., conducted climate vulnerability assessments.¹³⁶ Most also developed resilience plans.¹³⁷

¹²⁷ Gwynne Hogan, *‘They Dragged Their Feet’: Con Ed’s Plan for Heat Waves is Years Behind Schedule*, GOTHAMIST (July 24, 2019), <https://perma.cc/WL8U-J9SC>.

¹²⁸ Direct Testimony of James Van Nostrand and Tyler Fitch on Behalf of Vote Solar, In the Matter of Application of Duke Energy Carolinas, LLC for Adjustment of Rates and Charges Applicable to Electric Service in North Carolina, N.C. Util. Comm’n. Docket No. E-7, Sub 1214, at 53–54 (Feb. 18, 2020) [hereinafter Vote Solar DEC Testimony].

¹²⁹ Andrea K. Gerlak et al., *Climate Risk Management and the Electricity Sector*, 19 CLIMATE RISK MGMT., 12, 16 (2018).

¹³⁰ *Id.* at 18.

¹³¹ *Id.*

¹³² 2016 DOE PARTNERSHIP REPORT, *supra* note 42, at 12.

¹³³ 2016 CPUC REPORT, *supra* note 25, at 6.

¹³⁴ 2016 DOE PARTNERSHIP REPORT, *supra* note 42, at 27.

¹³⁵ U.S. Dep’t of Energy, *Partnership Description*, OFF. OF POL’Y, <https://perma.cc/5Q7A-T5EG> (last visited Mar. 23, 2021).

¹³⁶ The participating companies were: 1) Con Ed, 2) Dominion Energy, 3) Entergy Corporation, 4) Exelon Corporation, 5) Great River Energy, 6) Hoosier Energy, 7) Iberdrola USA, 8) National Grid, 9) New York Power Authority, 10) Pacific Gas and Electric Company, 11) Public Service Electric & Gas Company, 12) Southern California Edison, 13) San Diego Gas and Electric Company, 14) Seattle City Light, 15) Sacramento Municipal Utility District, 16) Tennessee Valley Authority, and 17) Xcel Energy, Inc. 2016 DOE PARTNERSHIP REPORT, *supra* note 42, at 5–7.

¹³⁷ At least fifteen companies developed resilience plans. ZAMUDA ET AL., ELECTRICITY, *supra* note 121, at 41.

The DOE provided participating electric utilities with general guidance on planning, “but encouraged each [utility] to determine the approach, level of detail, and specificity that was appropriate for their organization.”¹³⁸ As a result, the quality of electric utilities’ planning processes varied considerably, with some having major shortcomings.¹³⁹ For example:

- Three of the participating electric utilities based their climate vulnerability assessments solely on historic weather data and did not use forward-looking climate projections.¹⁴⁰ As DOE recognized, “relying solely on historical data puts a utility at risk of underestimating its vulnerability to future climate change impacts.”¹⁴¹
- Rather than consider the full range of climate impacts expected to occur within their respective service territories, most participating electric utilities focused on one or a subset of impacts.¹⁴² Notably, nine utilities did not consider changes in average or extreme temperatures that are projected to occur in all regions, and at least four coastal utilities did not consider sea level rise.¹⁴³ Some vulnerabilities were, therefore, almost certainly overlooked in the utilities’ assessments.
- Less than half of participating electric utilities assessed climate vulnerabilities across all of their “assets and operations.”¹⁴⁴ Several utilities considered only a sub-set of assets with many focusing on a single asset type, e.g., substations.¹⁴⁵ Again, this likely resulted in the utilities overlooking some vulnerabilities.
- While some participating electric utilities conducted quantitative exposure assessments to identify specific assets at risk from the studied climate impact(s), several undertook only a qualitative assessment, looking generally at possible risks to the types of assets they own but not conducting an asset-by-asset review.¹⁴⁶

¹³⁸ 2016 DOE PARTNERSHIP REPORT, *supra* note 42, at 4.

¹³⁹ *See id.* at 30–35 (discussing the adequacy of electric utilities’ climate vulnerability assessments); *See also* ZAMUDA ET AL., ELECTRICITY, *supra* note 121, at 1–7 (discussing examples of effective electric utilities’ resilience plans). The shortcomings in some electric utilities’ past climate vulnerability assessments and resilience plans highlight the need for careful scrutiny thereof by state utility commissions.

¹⁴⁰ 2016 DOE PARTNERSHIP REPORT, *supra* note 42, at 12.

¹⁴¹ *Id.*

¹⁴² Three companies considered only one type of climate impact (i.e., either “flooding & precipitation changes,” “summer storms (hurricanes, thunderstorms, wind),” or “winter storms (ice, snow, wind)”), while two others considered three or less. *See id.* at 5–7 (interpreting a table summarizing results of the partner vulnerability assessment).

¹⁴³ *Id.* at 20.

¹⁴⁴ Eight companies considered all “assets and operations,” four considered “assets” only, and five considered a “subset of assets.” *Id.* at 5–7.

¹⁴⁵ *Id.* at 8.

¹⁴⁶ *Id.* at 15.

This qualitative approach is unlikely to provide sufficient detail to enable the development of resilience plans.¹⁴⁷

A small number of state utility commissions have recently taken steps to promote more robust climate resilience planning by electric utilities. Examples are provided below.¹⁴⁸

1. California

In April 2015, then California Governor Jerry Brown signed an executive order requiring, among other things, an assessment of climate change vulnerabilities by economic sector.¹⁴⁹ In response, in July 2015, the CPUC and California Energy Commission established a working group to assist electric utilities to conduct climate vulnerability assessments and develop resilience plans.¹⁵⁰ While California's three largest electric utilities—Pacific Gas and Electric Company (PG&E), San Diego Gas and Electric Company (SDG&E), and Southern California Edison (SCE)—had already committed to doing so through DOE's Resilience Partnership, the CPUC and California Energy Commission working group encouraged them and other utilities to go beyond the requirements of that program.¹⁵¹

In a January 2016 report, the CPUC indicated that electric utilities “should create an iterative process” for climate resilience planning where updated information is available “at least in advance of every general rate case to inform the investment process.”¹⁵² PG&E, SDG&E, and SCE have since integrated climate change considerations into the Risk Assessment Mitigation Phase (RAMP) process they are required to complete prior to each rate case.¹⁵³ While requiring utilities to undertake resilience

¹⁴⁷ Qualitative assessments do not, for example, enable utilities to determine the precise number of at-risk assets. *Id.*

¹⁴⁸ Like the state utility commissions in California and New York, the Massachusetts Department of Public Utilities has also taken some steps to support climate resilience planning, but its efforts to do so have been more limited. *See* Mass. Dep't of Pub. Utils., Order Establishing Eversource's Revenue Requirement, D.P.U. 17-05, at 411 (Nov. 30, 2017) (While not as in-depth as the climate resilience planning in California and New York, the Massachusetts Department of Public Utilities nevertheless directed utility companies to identify potential risks to their assets and develop a climate change adaptation plan in order to enhance resilience and further the State's clean energy goals).

¹⁴⁹ Cal. Exec. Order No. B-30-15 (Apr. 29, 2015), <https://perma.cc/K6Y9-XG39>.

¹⁵⁰ CAL. NAT. RES. AGENCY, SAFEGUARDING CALIFORNIA: IMPLEMENTATION ACTION PLANS 88 (2016).

¹⁵¹ For example, the CPUC encouraged electric utilities to expand their vulnerability assessments to include a broader range of assets, among other things. 2016 CPUC REPORT, *supra* note 25, at 17.

¹⁵² *Id.* at 21.

¹⁵³ Established in December 2014 in response to the enactment of state legislation declaring “safety” to be “the top priority” of the CPUC, the RAMP process is intended to provide greater transparency on how electric and gas utilities assess and mitigate safety-related risks. To that end, prior to their three-yearly rate case, each utility must file with the CPUC a RAMP report that identifies the key risks it faces and options for mitigating those risks. Cal. Pub. Utils. Comm'n, Decision Incorporating a Risk-Based Decision-Making

planning is an important first step, the analysis in the utilities' RAMP reports is far from comprehensive.

The RAMP process was not designed specifically for climate resilience planning but rather as a more general tool electric and gas utilities can use to assess a wide range of safety-related risks to their operations. In their first RAMP reports, PG&E, SDG&E, and SCE all identified climate change as one of several key sources of safety-related risks.¹⁵⁴ The three utilities' reports discussed, in general terms, how various climate impacts could affect their operations. PG&E's report examined six climate impacts in two different time periods—i.e., 2022 and 2050—using two model scenarios for each.¹⁵⁵ This approach enabled PG&E to identify a range of plausible future climate outcomes in both the near- and long-term.¹⁵⁶ Based on those outcomes, PG&E estimated safety risks to its workforce and the general public from climate change in terms of additional injuries and deaths.¹⁵⁷ PG&E concluded that in 2022 it could “experience safety consequences for PG&E workforce and the public of an additional 25 – 129 injuries and 1 [-]3 fatalities per year due to climate change impacts, and in 2050, an additional 66 – 173 injuries and 2 – 5 fatalities.”¹⁵⁸ Both the 2022 and 2050 figures are significantly lower than the actual number of deaths caused by recent wildfires sparked by PG&E equipment and worsened by climate change.¹⁵⁹ For example, in 2020, PG&E pleaded guilty to eighty-four counts of involuntary manslaughter in connection with deaths arising from the 2018 Camp Fire which ignited when a PG&E owned and operated transmission line came into contact with dry vegetation.¹⁶⁰

Framework into the Rate Case Plan and Modifying Appendix A of Decision 07-07-004, Decision 14-12-025, at 3–4, 31, 32, 53 (Dec. 9, 2014), <https://perma.cc/ZU2W-TR9M>.

¹⁵⁴ See KEITH MELVILLE ET AL., RISK ASSESSMENT AND MITIGATION PHASE REPORT OF SAN DIEGO GAS & ELECTRIC COMPANY AND SOUTHERN CALIFORNIA GAS COMPANY 6 (2016) [hereinafter SDG&E RAMP] (interpreting a table summarizing the risks addressed in SDG&E's RAMP report); FADIA RAFFEEDIE KHOURY & KRIS G. VYAS, SOUTHERN CALIFORNIA EDISON COMPANY'S (U 338-E) 2018 RISK ASSESSMENT AND MITIGATION PHASE REPORT 2 (2018) [hereinafter SCE RAMP] (summarizing the safety risks that the SCE RAMP report explores); ARTHUR O'DONNELL ET AL., RISK AND SAFETY ASPECTS OF RISK ASSESSMENT AND MITIGATION PHASE REPORT OF PACIFIC GAS & ELECTRIC COMPANY INVESTIGATION 17-11-003, at 144–47 (2018) [hereinafter CPUC REVIEW OF PG&E RAMP] (summarizing the strengths and areas for improvement of PG&E's RAMP).

¹⁵⁵ PG&E analyzed risks associated with major storm events, sea level rise, subsidence, heat waves, wildfires, and drought in 2022 and 2050. CPUC REVIEW OF PG&E RAMP, *supra* note 154, at 144.

¹⁵⁶ *Id.*

¹⁵⁷ *Id.* at 145.

¹⁵⁸ *Id.*

¹⁵⁹ See Ivan Penn & Peter Eavis, *PG&E Pleads Guilty to 84 Counts of Manslaughter in Camp Fire Case*, N.Y. TIMES, <https://perma.cc/TX3X-UR2S> (last updated June 18, 2020) (noting the 2018 Camp Fire resulted in eighty-four fatalities).

¹⁶⁰ *Id.*; Jeff Daniels, *Officials: Camp Fire, Deadliest in California History, Was Caused by PG&E Electrical Transmission Lines*, CNBC, <https://perma.cc/9RDL-A7HL> (last updated May 16, 2019).

The RAMP reports prepared by SDG&E and SCE were more limited than that of PG&E, focusing on a smaller number of near-term, event-based climate impacts.¹⁶¹ All three utilities concluded that further analysis is required to determine the full extent of their climate vulnerabilities and develop resilience solutions.¹⁶² None of the utilities had published such analysis at the time of writing.

Seeking to advance climate resilience planning, in May 2018, the CPUC instituted proceedings to develop guidance for electric, gas, and other utilities “on how to incorporate [climate] adaptation into their planning and operations,” among other things.¹⁶³ In September 2020, the CPUC issued a decision requiring investor-owned energy utilities to submit climate vulnerability assessments every four years as part of their rate case filings.¹⁶⁴ The assessments must identify risks to the utilities’ assets, operations, and services from changing temperatures, sea-level rise, variations in precipitation, “wildfire, and cascading impacts/compounding incidents” over the next fifty years and options for dealing with those risks.¹⁶⁵ Each utility will be required to file its assessment with the CPUC prior to its general rate case. SCE will submit its first assessment in 2022, followed by PG&E in 2024, and SDG&E in 2025.¹⁶⁶

2. New York

In July 2013, as part of rate case proceedings for Con Ed, the New York Public Service Commission (NYPSC) convened a “Resiliency Collaborative” to explore issues related to storm hardening and climate

¹⁶¹ SDG&E focused on increased temperatures and heat waves, increased wildfires, precipitation changes, and sea level rise and analyzed risks associated with a potential “worst case scenario” involving “[e]xtreme winds in SDG&E’s Fire Threat Zone during a time of drought and elevated temperatures [that] cause a wire down event leading to a wildfire.” SDG&E RAMP, *supra* note 154, at 14-4 to 14-6. SCE examined risks associated with “99th percentile extreme heat events, extreme rain events, and extreme wildfires in the near term (2018-2023).” SCE RAMP, *supra* note 154, at 12-2.

¹⁶² SDG&E RAMP, *supra* note 154, at 14-2; SCE RAMP, *supra* note 154, at 12-44–12-45; CPUC Review of PG&E RAMP, *supra* note 154, at 147.

¹⁶³ Cal. Pub. Utils. Comm’n, Order Instituting Rulemaking to Consider Strategies and Guidance for Climate Change Adaptation, Rulemaking 18-04-019, at 2 (May 7, 2018), <https://perma.cc/Q84G-3HRK>.

¹⁶⁴ Cal. Pub. Utils. Comm’n, Decision on Energy Utility Climate Change Vulnerability Assessments and Climate Adaptation in Disadvantaged Communities (Phase 1, Topics 4 and 5), Rulemaking 18-04-019, Decision 20-08-046, at 4 (Sept. 3, 2020), <https://perma.cc/W4DY-E7M8>.

¹⁶⁵ *Id.* at 4–5.

¹⁶⁶ *Climate Change Adaptation*, CAL. PUB. UTIL. COMM’N, <https://perma.cc/K2QT-JLVV> (last visited Mar. 23, 2021). The filing dates are staggered to align with the utilities’ general rate cases. *See id.* (requiring utilities to file a vulnerability assessment one year before their rate case filing).

resilience.¹⁶⁷ Those issues received special attention in the rate case, largely because of New York's experience with Superstorm Sandy, which occurred less than three months before Con Ed filed its rate case. In its filing, Con Ed had requested approximately \$1 billion for "storm hardening structural improvements . . . that are intended to reduce the size and scope of service outages from major storms, as well as to improve responsiveness and expedite the recovery process."¹⁶⁸ Con Ed's focus solely on storm hardening prompted criticism from several environmental and other groups who pushed for a broader approach that would account for the full range of climate impacts.¹⁶⁹

The Resiliency Collaborative provided a forum for NYPSC staff, Con Ed, federal, state, and local government agencies, and a range of non-governmental organizations to work together on climate issues.¹⁷⁰ The participating groups reached a settlement requiring, among other things, Con Ed to complete a climate vulnerability assessment in 2014.¹⁷¹ While Con Ed missed that deadline,¹⁷² the completed assessment was published

¹⁶⁷ N.Y. Pub. Serv. Comm'n, Notice of Collaborative Meeting Concerning Storm Hardening and Resiliency Issues, Case 13-E-0030 et al. (July 1, 2013), <https://perma.cc/R37Q-UUSZ>.

¹⁶⁸ Letter from Craig S. Ivey, President, Consolidated Edison Co. of N.Y., Inc., to Hon. Jeffrey C. Cohen, Acting Sec'y, N.Y. Pub. Serv. Comm'n, 1 (Jan. 25, 2013).

¹⁶⁹ See N.Y. Pub. Serv. Comm'n, Order Approving Electric, Gas and Steam Rate Plans in Accord with Joint Proposal, Case 13-E-0030 et al., 62 (Feb. 21, 2014), <https://perma.cc/8MQ7-CCZW> [hereinafter NYPSC Rate Order] (filter document type to "Orders;" then follow "Order Approving Electric, Gas, and Steam Rate Plans in Accord with Joint Proposal" hyperlink) (noting several groups had filed testimony urging for a longer-term approach to ensure infrastructure could withstand more frequent and violent storms). Prior to the rate case proceedings, several environmental groups, led by the then Columbia Center for Climate Change Law (now the Sabin Center for Climate Change Law), had filed a petition with the NYPSC, requesting that it require all utility companies under its jurisdiction to engage in climate resilience planning. See Letter from Anne R. Siders, Assoc. Dir., Ctr. for Climate Change L., Colum. L. Sch., et al., to Hon. Jaelyn A. Brillling, Sec'y to the Comm'n, N.Y. Pub. Serv. Comm'n (Dec. 12, 2012), <https://perma.cc/D3P8-G392> (urging the Commission to require utilities to undertake long-term hazard planning and consider how infrastructure may be impacted by extreme weather scenarios).

¹⁷⁰ Participants in the Resiliency Collaborative were: 1) NYPSC Staff, 2) Con Ed, 3) City of New York, 4) County of Westchester, 5) New York State Office of Attorney General, 6) New York Department of Environmental Conservation, 7) Utility Intervention Unit, Division of Consumer Protection, Department of State, 8) New York University School of Law Guarini Center on Environmental and Land Use Law, 9) Institute for Policy Integrity, 10) Public Utility Law Project of New York, Inc., 11) New York Energy Consumers Council, Inc., 12) Consumer Power Advocates, 13) Utility Workers Union of America, AFL-CIO, Local 1-2, 14) Energy Initiative Group LLC, 15) Columbia University Center for Climate Change Law, 16) Environmental Defense Fund, 17) Pace Energy and Climate Center, and 18) Natural Resources Defense Council. See NYPSC Rate Order, *supra* note 169, at 63 n.46. For a discussion of the collaborative process, see Eleanor Stein, *Judging and Mediating for the "Long Emergency": Superstorm Sandy, New York State's Regulatory Response to the Climate Change Crisis, and Reforming the Energy Vision*, in *CRISIS LAWYERING: EFFECTIVE LEGAL ADVOCACY IN EMERGENCY SITUATIONS* 189, 191, 193, 197–201 (Ray Brescia & Eric K. Stern, eds., 2021).

¹⁷¹ NYPSC Rate Order, *supra* note 169, at 65, 71.

¹⁷² Hogan, *supra* note 127.

in the Con Ed Climate Study in December 2019¹⁷³ and is one of the most robust climate resilience planning effort undertaken by any electric utility to date.

The Con Ed Climate Study analyzed projected change in temperature, humidity, precipitation, sea level, and extreme weather in Con Ed's service territory over seven time periods spanning from 2020 through 2080.¹⁷⁴ Con Ed engaged scientists at Columbia University's Lamont-Doherty Earth Observatory and consultants at ICF International, Inc., to develop downscaled climate projections for three sub-areas within its territory based on thirty-two GCMs.¹⁷⁵ To account for uncertainty, the study team used multiple projections assuming different future greenhouse gas concentrations as well as "extreme event narratives" representing plausible worst-case scenarios.¹⁷⁶ The study team compared anticipated climate conditions against existing asset design and operating parameters to identify vulnerabilities within Con Ed's system and evaluated measures to address those vulnerabilities.¹⁷⁷ Based on that work and an assessment of broader electricity market trends, Con Ed will develop a Climate Change Implementation Plan identifying priority actions to be taken over the next five, ten, and twenty years to improve the resilience of its system to climate impacts.¹⁷⁸ That plan was expected to be published by the end of 2020.¹⁷⁹

In approving the settlement that led to the Con Ed Climate Study, the NYPSC encouraged other electric utilities in New York to also engage in climate resilience planning, stating:

The State's utilities should familiarize themselves with scientists' projections for local climate change impacts on each service territory. . . . We expect the utilities to consult the most current data to evaluate the climate impacts anticipated in their regions over the next years and decades, and to integrate these considerations into their system planning and construction forecasts and budgets.¹⁸⁰

Following the decision in Con Ed's rate case, the Sabin Center for Climate Change Law intervened in rate case proceedings involving two other New York-based utilities—Central Hudson Gas & Electric Corporation and Orange and Rockland Utilities, Inc.¹⁸¹ In both

¹⁷³ CONSOLIDATED EDISON, *supra* note 47, at 1.

¹⁷⁴ *Id.* at 18–19.

¹⁷⁵ *Id.* at 17.

¹⁷⁶ *Id.* at 17–19.

¹⁷⁷ *Id.* at 32–37, 38–49; *see infra* Part II.C Box 6.

¹⁷⁸ CONSOLIDATED EDISON, *supra* note 47, at 10.

¹⁷⁹ *Id.* at 1.

¹⁸⁰ NYPSC Rate Order, *supra* note 169, at 71–72.

¹⁸¹ N.Y. Pub. Serv. Comm'n, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Central Hudson Gas & Electric Corporation for Electric Service, Case 14-G-0319 (2014); N.Y. Pub. Serv. Comm'n, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Orange and Rockland Utilities, Inc. for Electric Service, Case 14-E-0493 (2014).

proceedings, a settlement was reached under which each utility agreed to review the Con Ed Climate Study upon its completion and evaluate whether the results of the study or other information “suggest a need for an adjustment associated with [the utility’s] capital expenditure planning or investment or operational procedures and whether further study may be required.”¹⁸² However, because the Con Ed Climate Study was not completed during the term of the settlement agreements, neither utility conducted the agreed upon review. To the authors’ knowledge, at the time of writing, no other New York-based electric utility had completed a climate risk assessment similar to that done by Con Ed.

Seeking to promote greater transparency of the climate risks facing electric utilities, in October 2020, the NYPSC initiated a new proceeding to address “matters related to the financial reporting of climate issues.”¹⁸³ It appears that the proceeding will focus on whether and how electric utilities should be required to make climate-related risk disclosures in their annual financial statements. The order initiating the proceeding noted that the parent companies of several New York-based electric utilities already disclose climate risks in their financial statements, but that the disclosures reflect “data aggregated at the holding-company level and [are] not utility specific.”¹⁸⁴ The order indicated that the NYPSC “believes” climate-related risk disclosures should be made at the utility level and solicited comments on the form of such disclosures.¹⁸⁵ Depending on the outcome of the proceedings, electric utilities could be forced to engage in climate resilience planning, i.e., to identify climate-related risks that must be disclosed.

Box 6: Key Findings from the Con Ed Climate Study

The Con Ed Climate Study revealed highly relevant, specific, and actionable information regarding the impacts of climate change on electric utility assets and operations.¹⁸⁶ Downscaled climate projections developed for the study detail a number of significant changes in weather conditions in Con Ed’s service territory, including a thirteen-fold increase in the number of days with temperatures above 86°F (30°C), a twenty-percent decrease in cold weather days, and a twenty-five-time increase in

¹⁸² N.Y. Pub. Serv. Comm’n, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Central Hudson Gas & Electric Corporation for Electric Service, Joint Proposal, Case 14-G-0319, at 51 (Feb. 6, 2015); N.Y. Pub. Serv. Comm’n, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Orange and Rockland Utilities, Inc. for Electric Service, Joint Proposal, Case 14-E-0493, at 52 (June 5, 2015).

¹⁸³ N.Y. Pub. Serv. Comm’n, Order Instituting Proceedings in the Matter Regarding the Need for Reporting Risks Related to Climate Change, Case 20-M-0499, at 9 (Oct. 15, 2020). While we focus here on electric utilities, the proceedings apply to New York gas utilities as well.

¹⁸⁴ *Id.* at 3.

¹⁸⁵ *Id.* at 8.

¹⁸⁶ *See supra* notes 175–177 and accompanying text.

heat wave events by 2050.¹⁸⁷ Precipitation in Con Ed's service territory is likewise expected to increase, with 500-year floods occurring every ten years by 2100 and the flood height associated with a 100-year flood increasing by up to fifty percent.¹⁸⁸ The study identified a number of ways in which these and other climate impacts could put Con Ed's infrastructure at risk.¹⁸⁹ For example, increased temperatures were shown to result in transmission line sag, which presents a safety risk.¹⁹⁰ Other infrastructure—particularly substations—was found to be at risk from climate change-amplified storm surge and flooding.¹⁹¹ Predicted peak load was also revised to reflect increased demand and reduced operational efficiency on hotter days.¹⁹²

III. ADVANCING CLIMATE RESILIENCE PLANNING THROUGH ELECTRIC UTILITY REGULATORY PROCEEDINGS

As discussed in Part II.C, state utility commissions have played an important role in advancing climate resilience planning in the electric utility sector, at least in some areas.¹⁹³ Recent proceedings before the CPUC and NYPSC, in particular, serve as case studies for how broad principles of utility regulation can be used to further climate resilience planning. In this Part, we discuss two possible avenues for engagement on climate resilience planning before state utility commissions, namely:

1. intervening in rate case proceedings for a specific electric utility to challenge its past or proposed future expenditures on the basis that it has not adequately considered climate risks and to obtain commission approval for the recovery of costs associated with climate resilience planning and investment; and
2. petitioning a state utility commission for a regulation or administrative order mandating climate resilience planning by all electric utilities under its jurisdiction.

For each avenue, we identify specific legal theories that require climate resilience planning, focusing in particular on electric utilities' core obligation to ensure reliable services at just and reasonable rates.

Box 7: State Utility Commissions' Authority to Consider Environmental Issues

State utility commissions are often thought of as economic regulators, responsible solely for ensuring that electric utilities deliver

¹⁸⁷ CONSOLIDATED EDISON, *supra* note 47, at 19–20.

¹⁸⁸ *Id.* at 22–24.

¹⁸⁹ *Id.* at 32–34, 39–46.

¹⁹⁰ *Id.* at 41.

¹⁹¹ *Id.* at 44.

¹⁹² *Id.* at 42.

¹⁹³ *See supra* Part II.C.

reliable service at low cost.¹⁹⁴ As such, environmental issues are often thought to fall outside the purview of state utility commissions and instead be the exclusive responsibility of environmental protection agencies.¹⁹⁵ In fact, state utility commissions often can and do act on environmental issues. A 2006 study found that “[f]ifteen state commissions have statutes explicitly setting out a general authority or obligation to consider environmental matters” and others have “implicit authority” to do so “through their general charge that regulation of public utilities furthers the public interest.”¹⁹⁶

Environmental issues are most commonly dealt with by state utility commissions in the context of facility siting decisions.¹⁹⁷ Those decisions may provide another avenue for identifying and assessing climate risks to electric utility infrastructure.

State statutes often expressly require state utility commissions to consider the environmental impacts of proposed infrastructure in their siting decisions.¹⁹⁸ In several states, the requirement is expressed in broadly-applicable environmental review statutes, which emulate the National Environmental Policy Act (NEPA).¹⁹⁹ Briefly, NEPA requires federal agencies to evaluate the environmental impacts of major projects they conduct, fund, or authorize.²⁰⁰ Agencies must consider environmental impacts against baseline conditions in the project area and account for climate change when defining the baseline.²⁰¹ Multiple

¹⁹⁴ See Michael Dworkin et al., *Revisiting the Environmental Duties of Public Utility Commissions* (2006), 7 VT. J. ENV'T L. 1 (2006) (noting that “[a] common misconception is that public utility commissions are solely economic regulators”).

¹⁹⁵ See *id.* (noting that “[u]nder this view, environmental protections agencies have the sole authority to address the environment and public health implications of electric utility service”).

¹⁹⁶ *Id.* at 1–2.

¹⁹⁷ Decisions regarding facility siting are the responsibility of the utility commissions in some (but not all) states. *Id.* at 1.

¹⁹⁸ See *id.* at 3 (“In thirty states, certification and siting review includes consideration of environmental protection.”).

¹⁹⁹ Sixteen states and the District of Columbia have environmental review laws similar to the NEPA. Daniel P. Selmi, *Themes in the Evolution of the State Environmental Policy Acts*, 38 URB. LAW. 949, 951 (2006); Patrick Marchman, *Little NEPAs: State Equivalents to the National Environmental Policy Act in Indiana, Minnesota and Wisconsin* (Sept. 2012) (unpublished capstone paper, Duke University). Some states exempt the utility commission from compliance with the environmental review statute. See, e.g., MONT. CODE ANN. § 75-1-201(3) (2019) (“The department of public service regulation, in the exercise of its regulatory authority over rates and charges of railroads, motor carriers, and public utilities, is exempt from” compliance with the state environmental review statute).

²⁰⁰ 42 U.S.C. § 4332(2)(C) (2018) (requiring preparation of an environmental impact statement for any “major Federal actions” that “significantly affect[s] the quality of the human environment”).

²⁰¹ See COUNCIL ON ENV'T QUALITY, CONSIDERING CUMULATIVE EFFECTS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT 1 (1997) (noting that “cumulative effects must be evaluated” and compared to “the no-action alternative as a baseline against which to evaluate cumulative effects”). In July 2020, the Council on Environmental Quality finalized revisions to its NEPA implementing regulations, which eliminate the former requirement to consider “cumulative effects” in environmental reviews. This will have the effect of

federal courts have held that agencies must consider how a proposed project will be affected by increasing temperatures, sea level rise, and other climate-induced phenomena.²⁰²

Consistent with the federal precedent, in states with their own “little NEPA” statutes, agencies are often required or encouraged to consider the impacts of climate change on projects as part of their environmental reviews.²⁰³ In Massachusetts, for example, state agencies are required to consider “predicted sea level rise” and other “reasonably foreseeable climate change impacts” when approving new projects.²⁰⁴ The Massachusetts Executive Office of Energy and Environmental Affairs has proposed for each new project agencies prepare a so-called “climate impact assessment” that evaluates the potential effects on the project of sea level rise, changes in precipitation, and changes in average and extreme temperatures; and the appropriateness of measures designed to reduce or avoid those impacts.²⁰⁵ These issues could be considered by the Massachusetts Department of Public Utilities, for example, when reviewing proposals for new transmission infrastructure.²⁰⁶ In Massachusetts and other states, third-parties can comment on proposals and intervene in review proceedings, which provides an opportunity to push for consideration of climate impacts.²⁰⁷

limiting consideration of climate change in environmental reviews. However, the revised regulations continue to require agencies to consider climate impacts when defining the baseline, at least in some circumstances. *See* Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act, 85 Fed. Reg. 43,304, 43,331 (July 16, 2020) (“[A]gencies will consider predictable environmental trends in the area in the baseline analysis of the affected environment,” including “[t]rends determined to be a consequence of climate change.”).

²⁰² *See, e.g.*, *AquAlliance v. U.S. Bureau of Reclamation*, 287 F. Supp. 3d 969, 1028 (E.D. Cal. 2018) (“NEPA requires an evaluation of the impact of climate change on a project.”); *see also, e.g.*, *Kunaknana v. U.S. Army Corps of Eng’rs*, 23 F. Supp. 3d 1063, 1093–98 (D. Alaska 2014) (determining that the Army Corps of Engineers should have considered new information about climate change when determining whether to prepare a supplemental EIS).

²⁰³ *See, e.g.*, CAL. CODE REGS. tit. 14, § 15064.4 (2018) (“In determining the significance of a project’s greenhouse gas emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project’s emissions to the effects of climate change.”).

²⁰⁴ MASS. GEN. LAWS. ch. 30, § 61 (2021).

²⁰⁵ Mass. Exec. Off. of Energy & Env’t Affairs, Draft MEPA Climate Change Adaptation and Resiliency Policy 4–8 (2015), <https://perma.cc/PR7C-8V9B>.

²⁰⁶ The Massachusetts Department of Public Utilities’ Siting Division is responsible for reviewing proposals to construct and operate transmission lines in the state. *DPU Siting Division*, MASS.GOV, <https://perma.cc/4PTG-Y7YW> (last visited Mar. 23, 2021). State agencies can make use of various publicly available tools and datasets to evaluate climate impacts on new infrastructure. *See generally* JESSICA WENTZ, ASSESSING THE IMPACTS OF CLIMATE CHANGE ON THE BUILT ENVIRONMENT UNDER NEPA AND STATE EIA LAWS: A SURVEY OF CURRENT PRACTICES AND RECOMMENDATIONS FOR MODEL PROTOCOLS 15–26 (2015), <https://perma.cc/7MC4-QE3G> (providing a list of tools available, sorted by source).

²⁰⁷ *E.g.*, *EFSB and DPU Siting Process*, MASS.GOV, <https://perma.cc/3F27-KGJR> (last visited Mar. 23, 2021).

A. Advocating for Climate Resilience Planning Through Rate Case Proceedings

Climate resilience planning may be advocated in rate case proceedings, wherein the state utility commission reviews and approves or rejects an electric utility's rates and other terms of service. Rate regulation is a core responsibility of all state utility commissions, which are charged with ensuring that electric utilities do not misuse their monopoly power in a way that harms customers, for example, by engaging in price gouging.²⁰⁸ The regulatory framework varies between states, but all require electricity rates to be "just and reasonable,"²⁰⁹ which has been interpreted to mean that rates must be "neither less than compensatory nor excessive."²¹⁰ To achieve that balance, state utility commissions set rates using a cost-of-service approach, under which electric utilities are permitted to earn a reasonable return on investments and recover reasonably incurred expenses.²¹¹

In some states, rate case proceedings are held on a fixed schedule, e.g., every three years, while in others they are conducted on an ad hoc basis.²¹² Rate case proceedings involve judicial-type processes, with parties filing briefs and written evidence and the state utility commission holding hearings in which witnesses appear and can be cross-examined.²¹³ Most state utility commissions also provide an opportunity for non-parties to make statements during the hearing or at other times.²¹⁴ That is one avenue for raising issues relating to climate resilience planning in rate case proceedings, which requires only minimal investments of time and other resources by the raising entity. It should, however, be noted that state utility commissions generally attach less weight to statements made by non-parties.²¹⁵ For that reason, interested persons may choose to formally intervene in, and become parties to, the rate case proceeding.

Intervention refers to the process by which interested persons obtain approval from the state utility commission to participate in rate cases or other proceedings.²¹⁶ Each commission has its own rules regarding participation, with most requiring third parties to file a petition to

²⁰⁸ REGUL. ASSISTANCE PROJECT, *supra* note 124, at 5–6.124 Even in states where the electricity sector has been deregulated, utility commissions continue to regulate rates for monopoly services, such as distribution. *Id.* at 8.

²⁰⁹ James M. Van Nostrand, *Keeping the Lights on During Superstorm Sandy: Climate Change Adaptation and the Resiliency Benefits of Distributed Generation*, 23 N.Y.U. ENV'T L. J. 92, 146 (2015) ("Ratemaking statutes uniformly require utility rates to be 'just and reasonable' or 'fair, just, reasonable, and sufficient.'" (citations omitted)).

²¹⁰ *Farmer's Union Cent. Exch., Inc. v. Fed. Energy Reg. Comm'n*, 734 F.2d 1486, 1502 (D.C. Cir. 1984).

²¹¹ REGUL. ASSISTANCE PROJECT, *supra* note 124, at 5.

²¹² *Id.* at 31.

²¹³ *Id.* at 31–35.

²¹⁴ *Id.* at 34.

²¹⁵ *Id.*

²¹⁶ *Id.* at 32.

intervene, which explains their interest in the case and reasons for intervening.²¹⁷ Some state utility commissions require would-be intervenors to demonstrate that their legal rights or duties will be substantially affected by the outcome of the proceeding and that their interests are not sufficiently represented by other parties.²¹⁸ Although some state utility commissions restrict intervention,²¹⁹ many are highly permissive of it and merely require a showing that it is “in the public interest.”²²⁰ However, there may be other practical challenges associated with intervening in rate case proceedings. Such proceedings can last for several months and are highly complex, dealing with a broad range of technical issues, most of which have little or no relevance to climate resilience planning. Nevertheless, even if an intervenor is focused solely on that one issue, the intervenor may need to be represented in hearings concerning other matters.²²¹ Intervenors may need to engage outside legal counsel to represent them and expert witnesses to appear on their behalf, which can be highly costly.²²²

The remainder of this subpart discusses three key ratemaking principles that could be relied on to advance climate resilience planning

²¹⁷ See, e.g., MO. CODE REGS. ANN. tit. 20, § 4240-2.075 (2019) (requiring petitions to intervene to be filed within 30 days after the commission gives notice of the case and include information about the petitioner, including a statement of the intervenor’s “interest in the case and reasons for seeking intervention”); OR. ADMIN. R. 860-001-0300 (2015) (requiring petitions to intervene to contain basic information about the petitioner, “[t]he nature and extent of the petitioner’s interest in the proceedings,” and “[t]he issues petitioner intends to raise at the proceedings”).

²¹⁸ See, e.g., KAN. ADMIN. REGS. § 82-1-225 (2021) (providing that a petition for intervention may only be granted if it “states facts demonstrating that the petitioner’s legal rights, duties, privileges, immunities, or other legal interests may be substantially affected by the proceeding”); OHIO ADMIN. CODE 4901-1-11 (2019) (allowing intervention by any person who “has a real and substantial interest in the proceeding” and who “is so situated that the disposition of the proceeding may . . . impair or impede his or her ability to protect that interest, unless the person’s interest is adequately represented by existing parties”).

²¹⁹ See, e.g., Public Service Electric and Gas Company, N.J. Bd. of Pub. Utils., Docket Nos. EO13020155 & GO13020156 (Sept. 30, 2013), <https://perma.cc/X6D6-CFK7> (denying Environmental Defense Fund intervenor status). *But see* Atlantic City Electric Company, N.J. Bd. of Pub. Utils., Docket No. ER16030252 (Oct. 5, 2016), <https://perma.cc/BR63-5KBW> (granting Environmental Defense Fund intervenor status).

²²⁰ See, e.g., 52 PA. CODE § 5.72 (2020) (allowing intervention where the petitioner has an “interest of such nature that participation of the petitioner may be in the public interest”); WASH. ADMIN. CODE § 480-07-355 (2020) (allowing intervention “if the petitioner’s participation is in the public interest”).

²²¹ The requirements regarding participation in hearings vary between states. In some states, intervenors must be represented at all or most of the hearing, even those portions that do not relate directly to climate resilience planning. In other states, intervenors have more flexibility, and can choose to only be represented at parts of the hearing.

²²² In some states, electric utilities provide limited funding to intervenors, but that funding is often only available to those representing consumer groups. See *generally Intervenor Funding*, OR. PUB. UTIL. COMM’N, <https://perma.cc/5J3V-97W8> (last visited Mar. 23, 2021).

in rate case proceedings: 1) the prudence standard, 2) the used and useful test, and 3) the least cost principle.²²³

1. *The Prudence Standard*

Prudence is a central tenet of electric utility rate regulation.²²⁴ Electric utilities are typically only permitted to recover prudent and necessary operating expenses and earn a return on prudent used and useful capital investments.²²⁵ State utility commissions assess prudence by considering what a reasonable, professional utility manager would have done given the information known or knowable at the time.²²⁶ The prudence standard has thus been described as similar to the reasonable person standard applied in tort law.²²⁷

In rate case proceedings, the burden of demonstrating prudence falls on the electric utility, which must prove that it acted reasonably in the circumstances.²²⁸ This requires a showing that the electric utility engaged in a sound decision-making process in which it took appropriate steps to obtain relevant information and evaluated that information in reaching

²²³ See *infra* Part III.A.1–3.

²²⁴ See *Long Is. Lighting Co. v. Pub. Serv. Comm'n State N.Y.*, 523 N.Y.S.2d 615, 620 (N.Y. App. Div. 1987) (describing prudence as “an essential constituent of utility regulation”); *Appeal of Conservation L. Found. of New England, Inc.*, 507 A.2d 652, 673 (N.H. 1986) (describing the prudence standard as a key principle governing ratemaking); see also *Gulf States Utils. Co. v. La. Pub. Serv. Comm'n*, 578 So.2d 71, 84 (La. 1991), *aff'd*, 1992 WL 608932 (La. P.S.C.) (stating that “one of the principles used by ratemaking bodies and courts to [determine how much of a utility’s investment in a particular plant should be included within its rate base] is the prudent investment standard”); *Entergy Gulf States, Inc. v. La. Pub. Serv. Comm'n*, 726 So.2d 870, 873–74 (La. 1999) (noting that the prudence standard is applied “to counterbalance the monopolistic effects on the ratepayers who do not have a choice about which company provides their utility service”); *Town of Hingham v. Dep’t of Telecomms. & Energy*, 740 N.E.2d 984, 989 (Mass. 2001) (indicating that “[t]he prudence test determines whether cost recovery is allowed at all”).

²²⁵ See generally REGUL. ASSISTANCE PROJECT, *supra* note 124, at 47, 51–52, 56–57 (explaining the allocation of costs and rate design for customer classes as important topics addressed by regulators in a general rate case). Some states do not require electric utilities to establish that their capital investments resulted in assets that are “used and useful.” See *infra* Part III.A.2.

²²⁶ *Jarvis*, *supra* note 126, at 1042.

²²⁷ See, e.g., *Appeal of Conservation L. Found. of New England, Inc.*, 507 A.2d at 673 (holding that the prudence standard “essentially applies an analogue of the common law negligence standard for determining whether to exclude value from rate base”).

²²⁸ See, e.g., *Long Is. Lighting Co.*, 523 N.Y.S.2d at 620 (holding that the “burden of proof is upon the utility whose rates . . . are being considered to justify its conduct”). Electric utilities generally benefit from a presumption of prudence absent evidence to the contrary. If there is any evidence suggesting imprudence, the burden shifts to the utility to demonstrate the appropriateness of its conduct. See, e.g., *Off. of Pub. Couns. v. Mo. Pub. Serv. Comm'n*, 523 S.W.3d 14, 19 (Mo. Ct. App. 2017) (holding that “[t]he presumption of prudence ‘sets out an *evidentiary presumption*’ which ‘provides that the utility’s expenditures are presumed to be prudent until adequate contrary evidence is produced, at which point the presumption disappears from the case’ . . . The ‘presumption affects who has the burden of proceeding, but it does not change the burden of proof, which [is] on the utility’” (citations omitted)).

its conclusion.²²⁹ As the Louisiana Supreme Court observed in *Gulf States Utilities Co. v. Louisiana Public Service Commission*,²³⁰ “the utility must demonstrate that it went through a reasonable . . . process to arrive at a course of action and, given the facts as they were or should have been known at the time, responded in a reasonable manner.”²³¹ The Louisiana Supreme Court held that to satisfy the prudence standard, the utility’s decision-making process must have been “logical” and based “on information and planning techniques known or knowable at the time” the decision was made.²³² However, in the case of long-running investment projects, the electric utility is not merely expected to act prudently at the outset but throughout.²³³ Thus, according to the Louisiana Supreme Court, electric utilities must “respond prudently to changing circumstances or new challenges that arise as a project progresses.”²³⁴ Courts and public utility commissions in other states have applied the prudence standard similarly.²³⁵

Applying the above principles, the prudence standard requires electric utilities to employ established techniques to evaluate and manage climate risks when making investment and other operational decisions that impact rates. The physical risks to electric system operation from increasing temperatures, more severe storms and wildfires, and other climate impacts have been well-documented in numerous government and independent reports.²³⁶ Electric utilities, therefore, can no longer feign ignorance. To use the parlance of the Louisiana Supreme Court, electric utilities now know, or should know, that the impacts of climate

²²⁹ *Gulf States Utils. Co. v. La. Pub. Serv. Comm’n*, 578 So.2d, 71, 85 (La. 1991), *aff’d*, 689 So.2d 1,337 (La. 1997).

²³⁰ 578 So.2d 71 (La. 1991).

²³¹ *Id.* at 85 (quotations omitted); *Gordon v. Council of New Orleans*, 977 So.2d 212, 225 (La. App. 4th Cir. 2008); *Entergy Gulf States*, 726 So.2d at 873.

²³² *Gulf States Utils.*, 578 So.2d at 85.

²³³ *Id.*

²³⁴ *Id.*

²³⁵ *See, e.g.*, *Citizens Action Coal. of Ind., Inc. v. N. Ind. Pub. Serv. Co.*, 472 N.E.2d 938, 958–59 (Ind. Ct. App. 1984) (holding that “[t]he measure of the prudence of utility expenditures is gauged by what one would consider good management decisions and practices” and that, where a utility undertakes a long-term project, it must respond prudently to changing circumstances); *Fitchburg Gas & Elec. Light Co. v. Dep’t of Pub. Utils.*, 956 N.E.2d 213, 216 (Mass. 2011) (indicating that “[w]hen conducting a prudence review, the [D]epartment [of Public Utilities] determines whether a utility’s actions, based on all that it knew or should have known at the time, were reasonable and prudent in light of the circumstances . . .”); *Long Is. Lighting Co.*, 523 N.Y.S.2d at 620 (holding that “[p]rudence is determined by judging whether the utility acted reasonably, under the circumstances at the time”); *Gulf States Utils. Co. v. Pub. Util. Comm’n*, 841 S.W.2d 459, 475 (Tex. App. 1992) (noting that the state utility commission defines prudence as “[t]he exercise of that judgement . . . which a reasonable utility manager would exercise . . . in the same or similar circumstances given the information” that was known or knowable); *Green Mountain Power Corp.*, 184 Pub. Util. Rep. 1, 135 (Vt. Pub. Serv. Bd. 1998) (stating that, to satisfy the prudence standard, the electric utility must “mak[e] all reasonable efforts to gather relevant information and . . . respond accordingly”).

²³⁶ *See supra* note 24 and accompanying text.

change pose material risks to their operations and assets. Indeed, many have admitted as much in their filings with the SEC and other documents.²³⁷

In this context, for electric utilities' decisions to be considered "logical" and "reasonable," they must integrate climate risk into their decision-making processes.²³⁸ Indeed, since many utility investment decisions involve assets that are intended to remain in operation for forty years or more, it is impossible to make rational choices without accounting for long-term climate impacts. Such climate-focused decision-making has been advocated by corporate analysts and advisors, including McKinsey and Company, which recently stated:

Climate change needs to become a major feature in corporate and public-sector decision making. . . . For companies, this will mean taking climate considerations into account when looking at capital allocation, development of products or services, and supply-chain management, for example. Large capital projects would be evaluated in a way that reflects the increased probability of climate hazards at their location: How will that probability change over time? What are the possible changes in cost of capital for exposed assets? How will climate risk affect the broader market context and other implicit assumptions in the investment case?²³⁹

Climate resilience planning enables electric utilities to answer these and other questions, thereby ensuring that their investment decisions are prudent in light of climate change. The techniques for climate resilience planning are well-established and have already been put into practice by some electric utilities. The Con Ed Climate Study, discussed in Part II.C, demonstrates that the necessary tools and data are available to evaluate the impacts of climate change over long periods and develop flexible resilience pathways to manage those impacts.²⁴⁰ In short, no electric utility or state utility commission can deny that the reasons for, and process of, climate resilience planning are now "known or knowable."

Given the above, to meet the prudence standard, electric utilities must engage in climate resilience planning and consider the findings thereof when making investment decisions. State utility commissions could mandate climate resilience planning by electric utilities on that basis. Moreover, regardless of whether state utility commissions impose such a mandate, electric utilities that fail to engage in climate resilience planning could have their investment decisions challenged in rate case proceedings. Such challenges could be used as leverage to secure a

²³⁷ See *supra* note 15 and accompanying text.

²³⁸ See JOHNSTON ET AL., *supra* note 24, at 5 (discussing how climate change will affect the entire electric sector and that it is generally feasible to adapt to the impacts of climate change given that "[m]uch of the electric power infrastructure is already designed and built with a significant degree of flexibility and resilience").

²³⁹ McKinsey & Co., *Confronting*, *supra* note 25, at 9–10.

²⁴⁰ See *supra* Part II.C (discussing the Con Ed Climate Study which analyzed the likelihood and consequences of a range of plausible climate outcomes enabling "Con Ed to identify vulnerabilities within its system and design flexible resilience pathways to manage those vulnerabilities").

commitment from the relevant electric utility to engage in climate resilience planning.²⁴¹ It could also result in disallowance of the electric utility's costs on the basis that they are imprudent, which would send a strong signal as to the importance of climate resilience planning and encourage other utilities to engage in the process.

At the time of writing, at least two electric utilities—Duke Energy Carolinas, LLC (DEC) and Duke Energy Progress, LLC (DEP)—had seen their expenditures challenged under the prudence standard on the basis that they failed to adequately consider climate risk. In February 2020, Vote Solar submitted testimony²⁴² in rate case proceedings for DEC before the North Carolina Utilities Commission challenging its request to recover “[c]osts incurred to maintain and modernize the Company’s electric system, generate cleaner power, improve reliability, [and] efficiently restore service to customers after major storm damage.”²⁴³ Subsequently, in April 2020, Vote Solar challenged DEP’s request to recover costs associated with grid maintenance and modernization in its rate case proceedings before the North Carolina Utilities Commission.²⁴⁴

Both challenges raised the same broad argument. Vote Solar noted that in developing their plans to maintain and modernize the electric system, DEC and DEP did not conduct a climate vulnerability assessment or any similar study of climate impacts, purportedly, because they “[we]re unable to say with certainty what the future impacts of climate change may or may not be.”²⁴⁵ Vote Solar argued that due to DEC and DEP’s failure to consider climate change there was insufficient evidence “to determine if the Compan[ies] made the most prudent prioritization and investments in light of [their] actual, projected climate risk.”²⁴⁶ Before the North Carolina Utilities Commission could rule on this issue, the parties reached a settlement under which DEC and DEP agreed to convene the Climate Risk and Resilience Working Group, which will look at ways to

²⁴¹ Disputes regarding the prudence of electric utility investments are, in practice, often resolved through settlement. See generally Eleanor Stein, *The Long Island City Power Outage Settlement: A Case Study in Alternative Dispute Resolution*, 27 PACE ENV'T L. REV. 357, 357 (2009) (providing a case study of how an extraordinary settlement agreement held the New York Public Utility Commission accountable and resulted in a rate benefit of \$46 million for all Con Edison customers after a nine-day power outage).

²⁴² Vote Solar DEC Testimony, *supra* note 128, at 1–2.

²⁴³ Application to Adjust Retail Rates, Request for an Accounting Order and to Consolidate Dockets, In the Matter of Application for Duke Energy Carolinas, LLC for Adjustment of Rates and Charges Applicable to Electric Service in North Carolina, N.C. Util. Comm'n, Docket No. E-7, Sub 1214, at 4 (Sept. 30, 2019), <https://perma.cc/B2C9-PMK3>.

²⁴⁴ Direct Testimony of James Van Nostrand and Tyler Fitch on Behalf of Vote Solar, In the Matter of Application of Duke Energy Progress, LLC for Adjustment of Rates and Charges Applicable to Electric Service in North Carolina, N.C. Util. Comm'n, Docket No. E-2, Sub 1219, at 2 (Apr. 13, 2020), <https://perma.cc/H5BH-2DFJ> [hereinafter Vote Solar DEP Testimony].

²⁴⁵ See Vote Solar DEC Testimony, *supra* note 128, at 19 (discussing DEC's response to discovery on how it manages climate-related risks); Vote Solar DEP Testimony, *supra* note 244, at 20 (discussing DEP's response to discovery on how it manages climate-related risks).

²⁴⁶ Vote Solar DEC Testimony, *supra* note 128, at 94; Vote Solar DEP Testimony, *supra* note 244, at 98.

assess the impacts of climate change on their systems and integrate consideration of those impacts into planning.²⁴⁷

2. *The Used and Useful Test*

Electric utilities that fail to adequately prepare for the impacts of climate change also risk being denied cost recovery for their capital investments under “the used and useful test.”²⁴⁸ Where that test applies, electric utilities are only permitted to include capital investments in their rate base that are physically used and useful in providing services to customers.²⁴⁹ The distinction between used and useful is somewhat blurry. Generally, however, state utility commissions look at whether an investment resulted in an asset that is physically providing services, thus, is “used”, and whether that asset is actually needed to provide those services, thus, “useful.”²⁵⁰

The used and useful test is most commonly employed to prevent electric utilities from including investments in assets that are still under construction into their rate bases.²⁵¹ Once an asset is completed and placed into service, the electric utility’s investment is typically added to its rate base. In each subsequent rate case proceeding, the state utility

²⁴⁷ Agreement and Stipulation of Settlement, In the Matter of Application Duke Energy Carolinas, LLC for Adjustment of Rates and Charges Applicable to Electric Service in North Carolina, N.C.U.C. Docket No. E-7, Sub 1214 (July 9, 2020), <https://perma.cc/6Q2C-7MDA> [hereinafter DEC Settlement Agreement]; Agreement and Stipulation of Settlement, In the Matter of Application of Duke Energy Progress, LLC for Adjustment of Rates and Charges Applicable to Electric Service in North Carolina, N.C.U.C. Docket No. E-2, Sub 1219 (July 9, 2020), <https://perma.cc/92S2-J5Y8> [hereinafter DEP Settlement Agreement]. DEC and DEP agreed to undertake climate-resilience planning “to study the impacts of climate change on the [ir Grid Improvement Plans] and existing grid, including operations, planning and physical assets on its transmission and distribution system . . . utilizing best-practices climate modeling and scenario analysis.” DEC Settlement Agreement at 4; DEP Settlement Agreement at 4.

²⁴⁸ A number of state utility commissions apply both the used and useful test and the prudence standard, though some commissions only employ one of the two standards. See generally Richard J. Pierce, Jr., *The Regulatory Treatment of Mistakes in Retrospect: Canceled Plants and Excess Capacity*, 132 U. PA. L. REV. 497, 511–13 (1984) (discussing how “[a] completed plant can be added to a utility’s rate base to the extent that it passes one or both” standards).

²⁴⁹ *Denver Union Stock Yard Co. v. United States*, 304 U.S. 470, 475 (1938).

²⁵⁰ See generally Jonathan A. Lesser, *The Used and Useful Test: Implications for a Restructured Electric Industry*, 23 ENERGY L. J. 349, 352 (2002) (explaining that “a reasonable interpretation [of the used and useful rule] is between investments that do not provide physical services (not used) and those that, while providing physical services, are superfluous (not useful”).

²⁵¹ The used and useful test has also been employed to exclude from rate base assets that are surplus to the utility’s requirements. For example, where an electric utility has a 1,000 megawatt short-fall in generating capacity and adds a new 2,000 megawatt plant, the excess 1,000 megawatts of supply may be temporarily excluded from the rate base until demand increases. See generally Van Nostrand, *supra* note 209, at 140–43 (describing the “short-term mismatch between loads and resources” and providing cases where state utility commissions excluded investments from the rate base due to this “mismatch”).

commission verifies that the asset is still used and useful and will remain so for the period during which the rates will be in effect.²⁵² An asset must be removed from the rate base if it ceases to be used and useful, for example, because of chronic operational problems that take it out of service for extended periods.²⁵³ In this regard, the Pennsylvania Public Utility Commission has held that: “The length of time which [an asset] may be out of service and not be removed from [the] rate base depends upon the nature of the plant, the degree to which the outage can be expected to occur during normal operation of the plant, and the certainty with which resumption of service can be predicted.”²⁵⁴

Prolonged outages, e.g., of a year or more, that are not expected with normal operation of assets may result in the assets being found to be not used and useful and thus removed from rate base.²⁵⁵

Without adequate planning and investment in resilience, climate impacts could render electric system assets inoperable, either permanently or for extended periods. Sea level rise is perhaps the most obvious example. A 2014 DOE study found that in Houston, Los Angeles, Miami, and New York City alone, up to forty-five energy facilities could be inundated due to sea level rise by 2050.²⁵⁶ Other climate impacts could also lead to premature facility retirement or service interruptions. Indeed, just last year, Xcel Energy accelerated its plans to close a coal plant in New Mexico due to water scarcity issues.²⁵⁷ As climate impacts worsen, more assets will be affected. For instance, the Con Ed Climate Study found that increasing temperatures would accelerate the aging of substation transformers, for which the design reference temperature is

²⁵² Pa. Pub. Util. Comm’n v. Metro. Edison Co., 53 Pa. PUC 329, 333 (Pa. Pub. Util. Comm’n June 15, 1979) (explaining that the commission must consider whether an “investment is or will be useful during [the] period in which the rates are to be in effect”).

²⁵³ *Id.*; see also Pa. Power Co. v. Pa. Pub. Util. Comm’n, 561 A.2d 43, 47–48 (Pa. Commw. Ct. 1989) (explaining that “[t]he touchstone for determining whether or not a prudently constructed unit *should be included in a utility’s rate base* is whether or not, *during the test year involved*, the unit will be used and useful in rendering service to the public.” (second emphasis added) (quoting Phila. Elec. Co. v. Pa. Pub. Util. Comm’n, 433 A.2d 620, 623 (Pa. Commw. Ct. 1981))).

²⁵⁴ *Metro. Edison Co.*, 53 Pa. PUC at 333.

²⁵⁵ *Id.* (holding that a nuclear generating facility expected to be offline for two to four years must be removed from rate base because such facilities “by their nature are not expected to experience [such prolonged] outages”).

²⁵⁶ U.S. DEP’T OF ENERGY, EFFECT OF SEA LEVEL RISE ON ENERGY INFRASTRUCTURE IN FOUR MAJOR METROPOLITAN AREAS 13 (2014), <https://perma.cc/MMP3-AE7G>.

²⁵⁷ Kavya Balaraman, *Water Scarcity Accelerates Plans to Close Xcel’s Tolk Coal Plant by a Decade*, UTIL. DIVE (Jan. 15, 2020), <https://perma.cc/M33B-79RX>.

This decision came as Moody’s raised concern over the effect of climate change induced heat and water stress on Xcel’s and other electric utility’s operations. Mike Hughlett, *Moody’s Gives Xcel ‘Red Flag’ for Water Stress Because of Climate Change in Southwest States*, STAR TRIBUNE (Jan. 22, 2020), <https://perma.cc/E2QM-GJMK>.

lower than the temperature projected to occur in the future due to climate change.²⁵⁸

Climate-affected facilities that retire prematurely will cease to be used and useful and thus effectively become stranded assets, the costs of which cannot be recovered by electric utilities in rates.²⁵⁹ The used and useful test would also prevent electric utilities from recovering the costs of assets that experience regular or extended outages due to the impacts of climate change. As noted above, in the past, facilities experiencing non-routine outages, which are not “expected to occur during normal operation[s],” e.g., unexpected maintenance, have been treated as not used and useful and therefore excluded from the electric utility’s rate base.²⁶⁰

3. *The Least Cost Principle*

By applying either, or both, the prudence standard and the used and useful test, state utility commissions ensure that electric utilities are only reimbursed for expenses that were reasonably incurred and deliver benefits to customers. This is consistent with the overarching goal of electric utility regulation—i.e., to ensure “just and reasonable” rates that appropriately balance utilities’ need to earn sufficient revenue to maintain their systems and make new investments against customers’ interest in keeping prices low.²⁶¹ The interest in keeping customer prices low has a particularly significant influence on state utility commissions’ regulatory decisions.²⁶²

Legislation in several states expressly identifies cost minimization as a goal of electric utility regulation. In Vermont, for example, legislation calls for “meeting the public’s need for energy services . . . at the lowest present value life cycle cost.”²⁶³ Legislation in South Carolina similarly declares a policy in favor of “minimiz[ing] the cost of energy throughout

²⁵⁸ CONSOLIDATED EDISON, *supra* note 47, at 40. The transformers have a design reference temperature of 86°F. In the future, however, New York City is projected to experience up to 26 days per year above 86°F, and 23 days above 95°F. *See id.* at 19.

²⁵⁹ *See, e.g., Several U.S. Nuclear Plants Retiring Early; Others at Risk*, INST. FOR ENERGY RSCH. (Oct. 14, 2013), <https://perma.cc/F69J-5TEY> (discussing how retiring nuclear power plants will increase the costs of energy).

²⁶⁰ *See Metro. Edison*, 53 Pa. PUC at 333 (holding that “[t]he length of time which utility plant may be out of service and not be removed from rate base depends upon the nature of the plant, the degree to which the outage can be expected to occur during normal operation of the plant, and the certainty with which resumption of service can be predicted”).

²⁶¹ *See Farmers Union Cent. Exch., Inc. v. Fed. Energy Reg. Comm’n*, 734 F.2d 1486, 1502 (D.C. Cir. 1984) (holding that, in setting rates, state utility commissions must balance the interests of electricity suppliers and their customers to determine a level that is “neither ‘less than compensatory’ nor ‘excessive’”).

²⁶² *See generally* Jeremy Knee, *Rational Electricity Regulation: Environmental Impacts and the “Public Interest”*, 113 W. VA. L. REV. 739, 761–62 (2011) (concluding that state utility commissions have generally exercised their ratemaking authority so as to “minimize costs (and maximize benefits) to society or consumers or both”).

²⁶³ VT. STAT. ANN. tit. 30, § 218c(a)(1) (2017).

the State.”²⁶⁴ Even absent this type of express statutory direction, state utility commissions have generally applied the principle of “least cost” when setting rates.²⁶⁵ In rate cases and other proceedings, state utility commissions have required electric utilities to take various steps to reduce electricity costs while maintaining service reliability. For example, as discussed in Part II.B above,²⁶⁶ electric utilities in thirty-six states are now required to engage in a process of integrated resource planning intended to identify the optimal resource mix that will ensure long-term service reliability at least cost.²⁶⁷

Requiring electric utilities to engage in climate resilience planning furthers the goal of reducing electricity costs while maintaining utilities’ ability to provide reliable service. As discussed in Part II above, such planning enables electric utilities to design new assets and systems that are “resilient from the start,” thereby avoiding the need for costly retrofits in the future.²⁶⁸ It also facilitates action to improve electric utilities’ ability to avoid or quickly recover from outages which further reduces costs. The reductions are likely to more than offset any costs incurred by electric utilities to enhance their climate resilience.

A 2019 study by McKinsey and Company found that, if left unaddressed, climate change would cause the storm damage and outage costs incurred by a typical electric utility to increase by at least twenty-three percent or \$300 million to \$1.7 billion by 2050.²⁶⁹ In comparison, according to the study: “[I]t would take \$700 million to \$1 billion for a typical Southeastern US utility to prepare for impacts related to climate change. That is . . . much less than the projected future storm costs of \$1.7 billion. While each utility’s cost-benefit calculation will differ based on its unique risk exposure profile and infrastructure costs, our conclusion is that it pays to prepare for extreme weather There are also likely to be ancillary benefits, such as improved reliability and enhanced diversity of supply.”²⁷⁰

²⁶⁴ S.C. CODE ANN. § 48-52-210 (2018).

²⁶⁵ See, e.g., *Re Ky. Power Co.*, No. 2009-00545, 2010 WL 2640998, at *1, 2 (Ky. Pub. Serv. Comm’n June 28, 2010) (“[R]ecogniz[ing] that ‘least cost’ is one of the fundamental principles utilized when setting rates that are fair, just, and reasonable.”).

²⁶⁶ See *supra* notes 95–100 and accompanying text.

²⁶⁷ Girouard, *supra* note 88; see also Energy Policy Act of 1992, Pub. L. No. 102-486, § 111(d), 106 Stat. 2795, 2796 (amending section 3 of the Public Utility Regulatory Policy Act to insert a new definition of “integrated resource planning” as follows: “The term ‘integrated resource planning’ means, in the case of an electric utility, a planning and selection process for new energy resources that evaluates the full range of alternatives . . . in order to provide adequate and reliable service to its electric customers at the *lowest system cost*” (emphasis added)).

²⁶⁸ See *supra* notes 99–100 and accompanying text.

²⁶⁹ Sarah Brody et al., *Why, and How, Utilities Should Start to Manage Climate-Change Risk*, MCKINSEY & CO. INSIGHTS (Apr. 24, 2019), <https://perma.cc/UQ9F-EH2F>. This is a conservative estimate because it only accounts for “regional increases in extreme weather or storm damage due to sea-level rise” and no other climate impacts. See *id.*

²⁷⁰ *Id.*

Confirming McKinsey and Company's conclusion, a 2020 study found that due to the impacts of climate change, spending on transmission and distribution infrastructure could increase by up to twenty-five percent or \$24 billion per year by 2090.²⁷¹ The study further found that designing new infrastructure based on projected climate conditions over its useful life "roughly halves the expected costs of climate change experienced in 2090" compared to a scenario in which no adjustments are made to infrastructure design.²⁷² Requiring electric utilities to take steps to enhance their resilience to climate change is, therefore, fully consistent with the least cost principle employed by state utility commissions when setting electricity rates.²⁷³

Box 8: Cost Recovery for Climate Resilience Planning and Investments

While it delivers many benefits, climate resilience planning also involves costs. Electric utilities must generally engage consultants or other researchers to develop localized climate projections and analyze the impact of projected conditions on assets.²⁷⁴ Where vulnerable assets are identified, electric utilities may need to make material investments to enhance their resilience, for example, through hardening or relocation. Electric utilities may be discouraged from investing by the uncertainty as to whether, when, and how they will be permitted to recover their costs.²⁷⁵

In the case of capital investments, cost recovery typically does not occur until after the electric utility has invested and the relevant state utility commission has determined that, among other requirements, the investment was "prudent," resulted in an asset that is "used and useful," or both.²⁷⁶ This approach ensures that customers are not burdened with inappropriately incurred costs²⁷⁷ but can discourage innovation by electric utilities concerned about the potential for disallowance of investments with novel or unquantified benefits.²⁷⁸ This is likely to be a particular issue with resilience investments, the benefits of which are

²⁷¹ Charles Fant et al., *Climate Change Impacts and Costs to U.S. Electricity Transmission and Distribution Infrastructure*, ENERGY, Mar. 2020, at 1, 1, 7.

²⁷² *Id.* at 7.

²⁷³ It should be noted that the least cost principle could be relied upon to challenge cost recovery for climate resilience planning and investment. Those activities often involve significant upfront costs, which may necessitate consumer rate increases, at least in the short term. In the longer term, however, climate resilience planning and investments should generate cost savings that can be passed onto ratepayers, as discussed above. Brody et al., *supra* note 269.

²⁷⁴ See discussion *supra* notes 50–53 and 77–86 and accompanying text.

²⁷⁵ See discussion *supra* notes 124–127 and accompanying text.

²⁷⁶ As discussed above, some state utility commissions only apply one of the two standards. See *supra* note 248 and accompanying text.

²⁷⁷ See generally Pierce, *supra* note 248 (referring to the prudent investment and useful tests and how this affects various commission's rate base and cost of constructing new plants).

²⁷⁸ See discussion *supra* notes 117–120 and accompanying text.

often uncertain or difficult to quantify.²⁷⁹ Compounding this problem, even where benefits are known and quantifiable, the benefits may not be taken into account by state utility commissions. A 2017 study by the Lawrence Berkeley National Laboratory found that several state utility commissions consider only a “[l]imited number of benefit categories” when evaluating resilience investments.²⁸⁰ For example, the Florida Public Service Commission focuses solely on the value of avoiding physical damage to electric utility infrastructure and does not account for the value to customers of avoiding service interruptions²⁸¹ despite the many tools available to estimate customer interruption costs.²⁸² State utility commissions should employ those and other tools to assess the full range of benefits of resilience investments. They should also look at using alternatives to cost-benefit analysis, such as breakeven analysis or RDM, to evaluate resilience investments.²⁸³

Even if electric utilities are permitted to recover resilience investments, the regulatory lag—i.e., the gap between when the investments are made and when cost recovery occurs—could undermine their financial viability.²⁸⁴ This is likely to be less of an issue in states where rate case proceedings are held on an ad hoc basis because, in those states, the electric utility can request adjustment of its rates to reflect new investments when they are made. This is not, however, possible in states where rate case proceedings are held on a fixed schedule, e.g., every three years. In those states, cost recovery may be delayed, which could affect the electric utility’s credit rating and thus its ability to obtain financing on reasonable terms. It could also lead to declining profits because the utility is required to cover financing costs internally for long periods of time.²⁸⁵

Given the above, electric utilities may want to obtain pre-approval of resilience investments, recover their costs as they are incurred, or both. This could be achieved through cost tracking, which, in simple terms, allows a utility to recover the costs associated with a specific activity on

²⁷⁹ See discussion *supra* notes 70–71 and accompanying text.

²⁸⁰ KRISTINA LACOMMARE ET AL., ENERGY ANALYSIS AND ENV’T IMPACTS DIV. LAWRENCE BERKELEY NAT’L LAB., EVALUATING PROPOSED INVESTMENTS IN POWER SYSTEM RELIABILITY AND RESILIENCE: PRELIMINARY RESULTS FROM INTERVIEWS WITH PUBLIC UTILITY COMMISSION STAFF 2–3 (2017), <https://perma.cc/9PPR-KC6X>.

²⁸¹ *Id.* at 25.

²⁸² One such tool is the Interruption Cost Estimate (ICE) Calculator, which was developed by Lawrence Berkeley National Laboratory and Nexant, Inc. The ICE Calculator can be used to estimate the cost of electricity outages per interruption event, per average kilowatt, or per unserved kilowatt hour. See Lawrence Berkeley Nat’l Lab. & Nexant, Inc., *ICE Calculator*, U.S. DEP’T OF ENERGY, <https://perma.cc/NQQ2-YZ5K> (last visited Mar. 24, 2021). The Florida Public Service Commission reportedly does not use the ICE Calculator or similar tools due to concerns about their accuracy. See LACOMMARE ET AL., *supra* note 280, at 3, 25.

²⁸³ See discussion *supra* notes 83–86 and accompanying text.

²⁸⁴ KEN COSTELLO, NAT’L REG. RES. INST., THE TWO SIDES OF COST TRACKERS: WHY REGULATORS MUST CONSIDER BOTH 4, 14 (2009), <https://perma.cc/UL6Z-W7HQ>.

²⁸⁵ *Id.* at 2, 14.

a periodic basis outside of its rate case.²⁸⁶ Historically, cost tracking was only permitted for substantial, variable, and uncontrollable costs that could threaten the utility's financial viability if not recovered outside its rate case, e.g., fuel costs.²⁸⁷ More recently, however, cost tracking has been permitted in a broader range of circumstances. For example, some state utility commissions have allowed cost tracking for investments in grid modernization technologies, e.g., advanced metering, reasoning that utilities may otherwise be reluctant to invest therein due to their high costs and unquantified benefits.²⁸⁸ The same will often be true of resilience investments.²⁸⁹ The appropriateness of allowing cost tracking for resilience investments must be assessed on a case-by-case basis and appropriate customer safeguards put in place. In the grid modernization context, some state utility commissions have capped the total amount utilities can recover through cost tracking and dealt with variations through risk-sharing mechanisms, under which cost overruns are borne primarily by the utility and cost under-runs allocated primarily to customers.²⁹⁰ A similar approach could be used for resilience investments.

B. Petitioning the State Utility Commission to Require Climate Resilience Planning

As well as addressing climate risk through rate case proceedings for specific electric utilities, state utility commissions could also deal with the issue in general rulemaking proceedings, involving all electric utilities under their jurisdiction. Through such proceedings a state utility commission could adopt an administrative order or regulation directing electric utilities to engage in climate resilience planning. The CPUC recently did just that, issuing a decision in August 2020 that requires investor-owned electric and gas utilities in California to periodically evaluate risks to their assets, operations, and services from the impacts of climate change.²⁹¹ The CPUC decision could serve as a model for other state utility commissions.

The CPUC's work on climate resilience was prompted, in part, by an executive order issued by then-California Governor Jerry Brown in April 2015.²⁹² The executive order noted that the impacts of climate change "pose tremendous risks to [California]'s people, agriculture, economy,

²⁸⁶ *Id.* at 2.

²⁸⁷ *Id.* at 7–8.

²⁸⁸ For a discussion of the use of cost tracking mechanisms in this context, see ROMANY WEBB, SABIN CTR. FOR CLIMATE CHANGE L., *DEPLOYING ADVANCED METERING INFRASTRUCTURE ON THE NATURAL GAS SYSTEM: REGULATORY CHALLENGES AND OPPORTUNITIES* 3, 23–24 (2018), <https://perma.cc/A79Y-6YM6>.

²⁸⁹ See discussion *supra* notes 124–126 and accompanying text.; see *supra* note 126 and accompanying text.

²⁹⁰ See WEBB, *supra* note 288, at 22–23 (explaining that cost tracking can shift the risk away from customers and instead place it with a utility's shareholders).

²⁹¹ Cal. Pub. Utils. Comm'n, *supra* note 163, at 2.

²⁹² Cal. Exec. Order. B-30-15, *supra* note 149, at art. 2.

infrastructure[,] and the environment” and that accounting for those risks “in planning and decision making will help the state make more informed decisions and avoid high costs in the future.”²⁹³ To that end, the executive order directed the California Natural Resources Agency to develop and maintain a statewide climate adaptation strategy that “identif[ies] vulnerabilities to climate change by sector” and “priority actions” to reduce those vulnerabilities.²⁹⁴ The California Natural Resources Agency appointed the CPUC, California Energy Commission, and California Department of General Services to lead adaptation efforts in the energy sector.²⁹⁵ The CPUC subsequently commenced a rulemaking proceeding on its own motion “to consider how to address climate change adaptation for the investor-owned electric and gas utilities” it regulates.²⁹⁶

Several other states also have policies regarding climate change adaptation,²⁹⁷ which could serve as the foundation for state utility commission action on the issue. For example, in October 2019, New Jersey Governor Philip Murphy signed an executive order mandating the development of a Statewide Climate Change Resiliency Strategy outlining measures the state should take to adapt to the impacts of climate change.²⁹⁸ In justifying the need for such a strategy, Governor Murphy noted that “the severity of future impacts of climate change on our State will directly depend on the willingness and ability of communities, businesses, industries, and government entities to integrate climate change considerations into planning and decision-making.”²⁹⁹ The Governor declared a statewide policy requiring agencies to “take proactive and coordinated efforts” to plan for, and protect against, climate impacts.³⁰⁰ That policy could be relied upon by the New Jersey Board of Public Utilities to justify commencing proceedings on electric utility climate resilience.

Where state utility commissions fail to act on climate resilience planning of their own initiative, third parties could petition them to do so. An example of this occurred in December 2012, when a coalition of environmental and public interest organizations filed a petition with the NYPSC, requesting that it direct all electric and other utilities under its jurisdiction to evaluate and plan for climate impacts.³⁰¹ The NYPSC did

²⁹³ *Id.* pmb1.

²⁹⁴ *Id.* art. 4.

²⁹⁵ CAL. NAT. RES. AGENCY, *supra* note 150, at 5–6.

²⁹⁶ Cal. Pub. Utils. Comm’n, *supra* note 163, at 17.

²⁹⁷ See *State Adaptation Progress Tracker*, GEO. CLIMATE CTR., <https://perma.cc/XRK5-PQS3> (last visited Apr. 1, 2021) (listing all the states with a climate adaptation plan).

²⁹⁸ See generally N.J. Exec. Order No. 89 (Oct. 29, 2019), <https://perma.cc/X3EC-SHD6> (stating all the objectives of New Jersey’s climate action plan).

²⁹⁹ *Id.* pmb1.

³⁰⁰ *Id.*

³⁰¹ See Letter from Anne R. Siders, Assoc. Dir., Sabin Ctr. for Climate Change L. et al, to Hon. Jaelyn A Brillling, Sec’y, N.Y. Pub. Serv. Comm’n (Dec. 12, 2012) [hereinafter NYPSC Petition] (on file with authors) (requesting the NYPSC to use its authority to require all

not take any formal action in response to the petition but, in a letter to the petitioners, then acting secretary of the Commission Jeffrey Cohen noted that New York Governor Andrew Cuomo had called for climate resilience planning and indicated that staff were working to identify planning approaches that were in the “best interests of ratepayers.”³⁰² The issues raised in the petition were ultimately dealt with in the Resiliency Collaborative convened by the NYPSC as part of Con Ed’s 2013 rate case.³⁰³

Like the NYPSC, other state utility commissions also allow third parties to file petitions seeking declaratory orders or the adoption or amendment of regulations.³⁰⁴ While the filing rules vary between states, there are often no or few restrictions on who can petition the commission, with many states allowing any person to do so, even if they do not have a demonstrated legal interest in the matter at issue.³⁰⁵ Thus, unlike intervenors in rate case proceedings—discussed above—petitioners are often not required to show that their legal rights or duties will be affected by the outcome of the petition.³⁰⁶

State utility commissions typically require petitions seeking the adoption or amendment of regulations to include suggested regulatory language.³⁰⁷ Petitions must also explain why regulatory or other action is being sought, the anticipated effects of such action, and the commission’s legal authority to take it.³⁰⁸ The latter is particularly important because, as most are statutory creations, state utility commissions can only act on petitions to the extent permitted under their authorizing statutes and related judicial decisions.³⁰⁹

utilities within its jurisdiction to prepare natural hazard mitigation plans for climate change).

³⁰² Letter from Jeffrey C. Cohen, N.Y. Dep’t Pub. Serv., to Anne R. Siders, Assoc. Dir., Sabin Ctr. For Climate Change L. (Jan. 16, 2013), <https://perma.cc/VE7N-Q8CZ>.

³⁰³ See *supra* notes 167–179 and accompanying text (discussing the scope of climate resilience planning in the Electric Utility Sector with an emphasis on the ConEd climate study).

³⁰⁴ See, e.g., Or. Pub. Util. Comm’n, 860-001-0250, 860-001-0430 (state rules allowing a person to petition to promulgate, amend, or repeal a rule and to petition for a declaratory ruling).

³⁰⁵ See, e.g., OR. ADMIN. R. 860-001-0250 (2021) (providing that any “person may petition the Commission to promulgate, amend, or repeal a rule”); see also *Id.* 860-001-0010(8) (stating that the definition of “person” is “provided in ORS 756.010(5)”; OR. REV. STAT. § 756.010(5) (2019) (defining “person” to “include[] individuals, joint ventures, partnerships, corporations and associations or their officers, employees, agents, lessees, assignees, trustees or receivers”).

³⁰⁶ See *supra* notes 214–220 and accompanying text.

³⁰⁷ See, e.g., CAL. CODE REGS. tit. 20, § 6.3(b) (2021) (stating that, where a petition seeks “adoption or amendment of a regulation,” it “must include specific proposed wording for that regulation”).

³⁰⁸ See, e.g., OR. ADMIN. R. 137-001-0070(1) (2021) (requiring petitions to include “[f]acts or arguments in sufficient detail to show the reasons for and effects of adoption, amendment, or repeal of the rule” and “[a]ll propositions of law to be asserted by petitioner”).

³⁰⁹ Some state utility commissions are established in the relevant state constitution. *E.g.*, CAL. CONST. art. XII, § 1.

Petitions regarding climate resilience planning could point to a number of legal principles that authorize, and in some cases even require, state utility commissions to act. Perhaps most notably, state utility commissions are responsible for ensuring that electric utilities fulfill their statutory “duty to serve,” including by providing reliable services to customers.³¹⁰ Climate resilience planning by electric utilities is necessary to assure long-term service reliability and thus fulfill the duty to serve.

Originally developed through the common law and now codified in state statutes, the duty to serve has been described as requiring electric utilities “to provide extraordinary levels of service to customers.”³¹¹ The duty encompasses, among other things, an obligation to provide adequate service.³¹² While each state has its own formulation, service adequacy is often defined in terms of reliability, with electric utilities expected to take appropriate steps to prevent outages and restore service promptly when they occur.³¹³ As the California Supreme Court succinctly explained more than half a century ago in *Langley v. Pacific Gas & Electric Co.*,³¹⁴ electric utilities must “exercise reasonable care in operating [their] system[s] to avoid unreasonable risks of harm to [their] customers” as a result of outages.³¹⁵ This principle was recently reiterated by a California court of appeal in *Mobil Oil Corp. v. Southern California Edison Co.*³¹⁶ In that case, the court held that while electric utilities are not expected to—and cannot—prevent all outages, they must take steps to minimize the effect on customers, including by engaging in appropriate planning.³¹⁷

Unless electric utilities plan for climate change, the more frequent and severe storms and other extreme weather events it brings will lead to additional and longer-lasting electricity outages, with potentially severe consequences for customers. However, electric utilities can minimize the risk of outages and their effect on customers by engaging in climate resilience planning. As discussed in Part II.A, climate resilience

³¹⁰ Jim Rossi, *The Common Law “Duty to Serve” and Protection of Consumers in an Age of Competitive Retail Public Utility Restructuring*, 51 VAND. L. REV. 1233, 1243 (1998).

³¹¹ *Id.* at 1242; Jim Rossi, *Universal Service in Competitive Retail Electric Power Markets: Whither the Duty to Serve?* 21 ENERGY L. J. 27, 29 (2000).

³¹² *See, e.g.*, CAL. PUB. UTIL. CODE § 451 (West 2021). (“Every public utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities . . . as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public.”); N.J. STAT. ANN. § 48:2-23 (2021) (“The board may . . . require any public utility to furnish safe, adequate and proper service.”); 66 PA. CONS. STAT § 1501 (2021) (“Every public utility shall furnish and maintain adequate, efficient, safe, and reasonable service and facilities.”).

³¹³ *See generally* Note, *The Duty of a Public Utility to Render Adequate Service: Its Scope and Enforcement*, 62 COLUM. L. REV. 312, 313, 313 n.6 (1962) (noting that, while “[t]he standard of adequacy is incapable of precise definition,” state statutes generally require utilities to “provide safe, continuous, comfortable, and efficient service,” and “to take precautions against [service interruptions] and to restore service as quickly as possible”).

³¹⁴ *Langley v. Pac. Gas & Elec. Co.*, 262 P.2d 846 (Cal. 1953).

³¹⁵ *Id.* at 853.

³¹⁶ *Mobil Oil Corp. v. S. Cal. Edison Co.*, No. B145834, 2003 WL 147770 (Cal. Ct. App. Jan. 21, 2003).

³¹⁷ *Id.* at *8.

planning enables electric utilities to identify where and when their systems are vulnerable to the impacts of climate change and develop solutions to mitigate those vulnerabilities, such that they can continue to provide reliable electricity services to customers despite climate change.³¹⁸

Requiring electric utilities to take steps to avoid future reliability issues falls squarely within state utility commissions' regulatory mandate. There is no doubt that climate resilience planning is necessary for electric utilities to operate their systems with "reasonable care" to "avoid unreasonable risks of harm" to their customers. Indeed, with the impacts of climate change and their effects on electric systems now well documented in numerous government and other reports,³¹⁹ it is not reasonable for electric utilities to continue operating their systems based on past climate conditions. Doing so exposes customers to an unreasonable risk of harm from increasingly frequent and severe outages, which could be avoided or mitigated by employing proven climate resilience planning techniques.

Relatedly, where state law imposes requirements on electric utilities with respect to storm or other extreme event preparedness, that provides another legal justification for requiring climate resilience planning. For example, the December 2012 petition filed with the NYPSC cited section 66 of the New York Public Service Law, which requires electric utilities to develop "emergency response plans" that outline measures to prepare for, and ensure prompt restoration of service after, storms and similar events.³²⁰ The petition noted that electric utilities' emergency response plans focus solely "on anticipation and response to disasters in the short-term" and argued that "[a]dequately planning for storms, as required under the Public Service Law, requires long-term assessment of risks," based on "future climate predictions."³²¹ This enables electric utilities to make a more informed assessment of how frequently storms will occur, their likely severity, and what system changes are needed to prevent and manage associated outages.³²²

IV. ADVANCING CLIMATE RESILIENCE THROUGH TORT LAW CLAIMS IN STATE COURT

Part III considered whether and when state public utility law requires electric utilities to address the consequences of climate change through climate resilience planning. In this Part we consider the use of

³¹⁸ See *supra* Part II.A.

³¹⁹ See *supra* note 24 and accompanying text.

³²⁰ NYPSC Petition, *supra* note 301; see also N.Y. PUB. SERV. LAW § 66.21(a). Similar planning obligations are imposed on electric utilities in many other states. See, e.g., FLA. STAT. § 366.96(1)(e), (3) (2019); MASS. GEN. LAWS. ch. 164, § 85B (2018); 16 TEX. ADMIN. CODE § 25.53(b) (2021).

³²¹ NYPSC Petition, *supra* note 301.

³²² *Id.*

tort law to advance climate resilience planning in the electric utility sector.

Although factual considerations often remain similar in the context of public utility and tort law, and the evidence identified in Part II³²³ will be relevant in both areas, the two bodies of law diverge in material ways. Most significantly, whereas claims grounded in public utility law will often center primarily on anticipated impacts of climate change, tort law claims will generally be based upon some prior impact. For the purpose of this Article, we term the contemplated tort law claim a “climate resilience claim,”³²⁴ and define it as a claim arising from an electric utility’s failure to adequately prepare for reasonably foreseeable event- and non-event-based climate impacts to owned assets, operations, or both where that failure results in cognizable harm. Cognizable harm could include injury to persons, property damage, or both resulting from electricity service outages. For example, a heat wave causes a transmission line to sag, triggering an outage that results in a blackout at the premises of a customer who uses electricity to power a medical device. Climate resilience claims could also arise in situations where the harm, e.g., personal injury or property damage, is not directly connected to, or the result of, a service outage. One example might be where transmission line sag caused by a heat wave sparks a wildfire, which damages property.³²⁴

This Part explores whether and when a climate resilience claim could be brought against an electric utility in connection with its failure to engage in climate resilience planning. The Part proceeds in primarily four subparts, modeled upon common law tort claims. First, the Part explores the bounds of an electric utility’s duty of care and argues that it encompasses a duty to prepare for the impacts of climate change.³²⁵ Second, the Part describes how such a duty might be breached by failing to engage in climate resilience planning.³²⁶ In particular, four approaches to identifying breach are discussed: risk-utility analysis, the multi-factor balancing test, industry custom, and public policy considerations.³²⁷ Third, causation is considered, with particular emphasis upon proximate cause and foreseeability.³²⁸ Fourth, harm is explored with the underlying retroactive basis for tort claims noted above distinguished from the fundamentally proactive focus, which undergirds state utility commission proceedings.³²⁹ Before turning to those subparts, however, we first address questions of precedent.

³²³ See *supra* Part II.

³²⁴ Importantly, we do not foreclose the possibility of some tort law climate resilience claim based on the showing of an event not yet occurred. However, we do not consider such issues here.

³²⁵ See *infra* Part IV.B.

³²⁶ See *infra* Part IV.C.

³²⁷ *Id.*

³²⁸ See *infra* Part IV.D.

³²⁹ See *infra* Part IV.E.

A. Climate Resilience Claims and Precedent

In examining climate resilience claims, this work draws primarily from three sources of precedent: 1) extreme weather tort claims, 2) statutory failure to adapt claims, and 3) tort claims premised on defendants' direct greenhouse gas emissions or sale of fossil fuels. Climate resilience claims, however, are premised upon a different theory and basis than these sources of examined precedent and are therefore compared and distinguished in this subpart.

In borrowing from precedent, we rely most heavily upon negligence suits brought against electric utilities in the context of extreme weather events, which we term "extreme weather tort claims." Such claims typically arise from an electric utility's failure to adequately prepare for, or respond to, a particular extreme weather event that impacts its owned assets or operations. Take, for example, *Rich Mountain Electric Cooperative, Inc. v. Revels*.³³⁰ There, a severe storm took down a tree, which in turn pulled down one of the utility's distribution lines, causing power outages.³³¹ As a result, the plaintiff—a chicken farmer—was unable to operate cooling equipment in his sheds, which resulted in the death of several thousand chickens when temperatures skyrocketed to over 100 degrees Fahrenheit the following day.³³² Plaintiff argued that the utility should "have more diligently pursued the cause of the outage."³³³ The court agreed, holding that the utility "is required to use active diligence to discover defects in its system," but "had not been actively diligent in pursuing the outage."³³⁴

Extreme weather tort claims and climate resilience claims share similarities. The form of the injury can overlap³³⁵ and questions of foreseeability are often central to the analysis.³³⁶ Yet, the claims diverge in important ways. Temporally, an extreme weather tort claim generally focuses on the electric utility's immediate actions in response to an impending or recently occurred event, and questions of negligence center upon the reasonableness of that activity within a relatively short timeframe. The focus of *Rich Mountain Electric*, for example, was upon utility action in the hours before and after the storm.³³⁷ A climate resilience claim, however, is focused on the sufficiency of longer-term utility planning for climate change. The focus is on whether the utility has adequately incorporated climate considerations into its operating

³³⁰ 841 S.W.2d 151 (Ark. 1992).

³³¹ *Id.* at 152.

³³² *Id.*

³³³ *Id.* at 153.

³³⁴ *Id.* at 153–54 (quoting *Stacks v. Ark. Power & Light Co.*, 771 S.W.2d 754, 756 (Ark. 1989)).

³³⁵ For example, in both extreme weather tort claims and climate resilience claims, the "harm" could involve personal injury or property damage resulting from electricity service outages. See *infra* Part IV.E.

³³⁶ See *infra* Parts IV.B and IV.D.

³³⁷ 841 S.W.2d at 153–54.

procedures, practices, and decisions regarding capital investments and expenditures. These distinctions have important implications for utility obligation. While an extreme weather tort claim may focus inquiry on whether, for example, the utility's emergency response or customer notification was reasonable, a climate resilience claim would center analysis on the extent to which the utility's long-term planning reasonably considered the impacts of climate change on assets and operations.

Looking forward, extreme weather tort claims and climate resilience claims may be complementary and brought together. Because both claims can be premised upon similar events and harms, but are different legal theories, future actions may present both to the court to capture a wider range of utility policies and practices.

A second body of relevant precedent is found in statutory "failure to adapt" lawsuits.³³⁸ These cases, like the Conservation Law Foundation's (CLF) lawsuits against ExxonMobil and Shell, are premised on each defendant's failure to consider climate change impacts in complying with their statutory and permitting obligations. In both cases, CLF alleges that the companies failed to consider known climate change-induced effects in designing and implementing protective measures for their facilities as required by federal law.³³⁹ These claims provide a helpful comparison, as they, like climate resilience claims, premise argument upon an actor's failure to plan for reasonably foreseeable impacts of climate change to assets and operation. These claims should be distinguished, however, as they have a statutory basis, whereas climate resilience claims are premised upon common law obligations.³⁴⁰

Third and finally, we also consider tort law claims premised on an entity's contribution to climate change, either direct or indirect. Some cases, like *American Electric Power Co. v. Connecticut*,³⁴¹ brought under

³³⁸ CONSERVATION L. FUND., CLIMATE ADAPTATION AND LIABILITY: A LEGAL PRIMER AND WORKSHOP SUMMARY REPORT 30 (2018), <https://perma.cc/LT6C-4H3N>; Dena P. Adler, *Turning the Tide in Coastal and Riverine Energy Infrastructure Adaptation: Can an Emerging Wave of Litigation Advance Preparation for Climate Change?*, 4 OIL & GAS, NAT. RES. & ENERGY J. 519, 520 (2018).

³³⁹ See *infra* notes 392–394 and accompanying text.

³⁴⁰ Complaint for Declaratory and Injunctive Relief and Civil Penalties at 1, Conservation Law Found. v. ExxonMobil Corp., No. 1:16-cv-11950, 448 F. Supp.3d 7 (D. Mass. Sept. 29, 2016) [hereinafter CLF ExxonMobil Complaint]; Complaint for Declaratory and Injunctive Relief and Civil Penalties at 1, Conservation Law Found. v. Shell Oil Products US, No. 1:17-cv-00396, 2020 WL 5775874 (D.R.I. Aug. 28, 2017) [hereinafter CLF Shell Complaint]. Another example, while not actively referencing or relying on climate change, is the wave of lawsuits brought after Arkema's Crosby Facility in Houston exploded in the wake of Hurricane Harvey. Those suits allege Arkema failed to adapt to the increased chance of greater flooding by not implementing procedures for handling dangerous chemicals in such a situation. See Harris County's Original Petition and Application for Permanent Injunction at 15, Harris County, Texas v. Arkema, Inc., No. 2017-76961 (Tex. Dist. Ct. Nov. 16, 2017); Plaintiffs' Original Petition and Application for Temporary Restraining Order and Temporary Injunction and Request for Disclosure at 7, Graves v. Arkema, Inc. No. 4:17-CV-3068, 2018 WL 10158337 (Tex. Dist. Ct. Sept. 7, 2017).

³⁴¹ Am. Elec. Power Co. v. Connecticut, 564 U.S. 410 (2011).

federal common law, sought to hold defendants liable for their direct emission of climate-damaging greenhouse gases.³⁴² Other cases have been brought against fossil fuel companies in respect of the climate damage caused by the production and use of their products. Two recent examples are *City of Baltimore v. BP*³⁴³ and *County of San Mateo v. Chevron*.³⁴⁴ There, plaintiff local governments have sought to impose liability for adaptation measures in response to rising sea levels and other climate impacts on the companies that have profited from the production and sale of fossil fuels.³⁴⁵ The cases center upon the production and promotion of fossil fuels by defendants and the alleged disinformation campaign mounted by them to obscure the inevitable climate effects of defendants' activities.³⁴⁶ A climate resilience claim is premised upon a different theory and basis. Specifically, a climate resilience claim, as considered here, focuses on the defendant's failure to adequately prepare for the impacts of climate change on its own assets and operations.

Given the untested nature of climate resilience claims, likely obstacles and challenges are particularly important to consider. Some, such as interaction between civil and public utility commission forums, and potential regulatory barriers such as limitation of liability provisions in utility tariffs are explored in greater detail in Part V.³⁴⁷ Others, such as the highly complex and technical nature of the evidence required to establish a climate resilience claim, and variation in tort and utility law across states are not exhaustively addressed in this Article and deserve careful consideration and further attention.

³⁴² *Id.* at 415.

³⁴³ *Mayor & City Council of Baltimore v. BP P.L.C.*, 952 F.3d 452 (4th Cir. 2020), *vacated*, BP P.L.C. v. Mayor and City of Baltimore, U.S. No. 19-1189 (May 17, 2021).

³⁴⁴ *Cty. of San Mateo v. Chevron Corp.*, 960 F.3d 586 (9th Cir. 2020).

³⁴⁵ Plaintiff's Complaint at 107–08, *Mayor & City Council of Baltimore v. BP P.L.C.*, No. 24-C-18-004219, 2018 WL 4236520 (Md. Cir. Ct. July 20, 2018) [hereinafter *Baltimore Complaint*]; Complaint at 78–79, *Cty. of San Mateo v. Chevron Corp.*, No. 17 Civ. 03222 (Cal. Super. Ct. July 17, 2017) [hereinafter *San Mateo Complaint*]. Suits against fossil fuel companies have also been brought by private parties. *See Comer v. Murphy Oil USA*, 585 F.3d 855, 860 (5th Cir. 2009) (holding plaintiffs had standing and that none of the claims presented non-justiciable political questions), *reversed and remanded*, 607 F.3d 1049, 1053–54 (5th Cir. 2010) (Fifth Circuit local rules require that decisions be vacated when rehearing en banc is granted. In this case, the Fifth Circuit granted rehearing and then lost quorum due to the recusal of a judge. It therefore dismissed the appeal and let the district court's dismissal of the case stand because it had already vacated its previous decision.), *dismissed on remand*, 839 F. Supp.2d 849, 857, 862, 865 (S.D. Miss. 2012) (holding that the plaintiffs' claims were barred by the doctrines of res judicata and collateral estoppel or, alternatively, that the plaintiffs did not have standing to assert their claims), *affirmed*, 718 F.3d 460, 464 (5th Cir. 2013) (upholding the district court's dismissal of the case on the basis of res judicata).

³⁴⁶ *See, e.g.*, *San Mateo Complaint*, *supra* note 345, at 95 (arguing that “[g]iven the grave dangers presented” a “reasonable” fossil fuel producer “would have warned of those known, inevitable climate effects”); *Baltimore Complaint*, *supra* note 345, at 5 (“Defendants’ production, promotion, marketing of fossil fuel products, simultaneous concealment of the known hazards of those products, and their championing of anti-science campaigns, actually and proximately caused Plaintiff’s injuries.”).

³⁴⁷ *See infra* Part V.

B. Duty of Care

In tort law, whether an electric utility has an obligation to consider the consequences of climate change turns first upon the presence of a duty. This duty is most often—but not always³⁴⁸—a duty of care. The *Restatement (Second) of Torts*, describes the duty of care to denote the fact that the actor is required to conduct himself in a particular manner at the risk that if he does not do so he becomes subject to liability to another to whom the duty is owed for any injury sustained by such other, of which that actor’s conduct is a legal cause.³⁴⁹

That is, “the law imposes a duty of reasonable care to avoid foreseeable harm when performing acts that could injure others.”³⁵⁰ In considering whether a duty of care is present, two inquiries are relevant: “to whom is the duty owed?, and [] what does the duty entail?”³⁵¹

Box 9: Wildfires and Climate Resilience Claims

Recent wildfires in the western U.S. serve as an increasingly alarming and visible example of climate change-amplified extreme weather. Entities charged with operation of the electric grid increasingly acknowledge the intersections among extreme weather, electricity service, and consequences of climate change. The CAISO concluded, for example, that “climate change-induced extreme heat storm[s] across the western U.S.” contributed to recent supply shortfalls and electricity outages.³⁵² The CPUC has likewise made clear that “[utilitie]s need to ensure a comprehensive approach to climate change risk is developed across all of the [utilitie]s’ various departments to ensure a comprehensive approach to the [utilitie]s’ climate change adaptation efforts.”³⁵³

Wildfires in the western U.S. have also been the focus of significant litigation, with the 2018 Camp Fire a primary example. The Camp Fire, sparked by a faulty electric transmission line owned by PG&E and worsened by climate change-induced drought and high temperatures, resulted in the deadliest and most destructive wildfire in California’s history at the time, with over 153,000 acres burned, more than 18,000 structures destroyed, and 85 fatalities.³⁵⁴ PG&E faced various

³⁴⁸ See *infra* Part IV.B.2 Box 10.

³⁴⁹ RESTATEMENT (SECOND) OF TORTS § 4 (AM. LAW INST. 1965).

³⁵⁰ Alice C. Hill, *Jump-Starting the Fight Against Climate Change: The Courts*, BULLETIN ATOMIC SCI. (Sept. 25, 2019), <https://perma.cc/K4HY-YH54>.

³⁵¹ David Hunter & James Salzman, *Negligence in the Air: The Duty of Care in Climate Change Litigation*, 155 U. PENN. L. REV. 1741, 1746 (2007).

³⁵² CALIFORNIA ISO, CAISO, CPUC, AND CEC ISSUE PRELIMINARY REPORT ON CAUSES OF AUGUST ROTATING OUTAGES 2 (Oct. 6, 2020), <https://perma.cc/AD5A-6UL3>; see *supra* Part II.B. Box 4.

³⁵³ Cal. Pub. Utils. Comm’n, *supra* note 164, at 107.

³⁵⁴ Cal. Pub. Utils. Comm’n, Investigation 19-06-015: Decision Approving Proposed Settlement Agreement with Modifications, at 3 (May 7, 2020), <https://perma.cc/WWS3-M8CN>.

subsequent claims and claimants, ultimately resulting in criminal charges, bankruptcy, and a CPUC approved settlement (among other things).

The CPUC's Safety and Enforcement Division found several failures on the part of PG&E in the context of the Camp Fire, including failure to maintain, reinforce, and regularly inspect its transmission lines and other equipment.³⁵⁵ The CPUC itself found that the utility "ha[d] a demonstrated record of failing to comply with Commission directives, including those related to vegetation management."³⁵⁶

Failure to properly maintain equipment serves as a basis for many extreme weather tort claims. In *Arkansas Valley Electric Cooperative Corp. v. Davis*,³⁵⁷ for example, the plaintiff was injured after coming into contact with a fallen electric power line.³⁵⁸ The plaintiff argued that the injury was due to the defendant utility's negligence in "fail[ing] to replace the pole which they knew to be deteriorated" and "fail[ing] to maintain the pole and power line."³⁵⁹ The Arkansas Supreme Court found that the lower court's inference of negligence was reasonable and based on substantial evidence, including findings "that the pole was at twenty-five percent strength," and insufficiently buried.³⁶⁰ The defendant contended in response that the injury was "an act of God," meaning "a violent disturbance of the elements such as a storm, a tempest, or a flood."³⁶¹ The court, in finding against the defendant, carefully distinguished the negligent conduct at issue from a liability due to "damages [] caused solely by an act of God."³⁶² The court held that "[i]f an act of God concurs with the negligence or fault of man to proximately cause damages, the negligence or fault is not excused by the act of God."³⁶³

Failure to properly maintain equipment might also serve as a basis for a climate resilience claim. As noted above, climate-amplified wildfires are increasingly foreseeable, and an electric utility's failure to adequately prepare for such a reasonably foreseeable event may establish a basis for liability. That is, electric utility planning standards, equipment deployments, investment decisions, and operational decisions must keep pace with the impacts of climate change. Not doing so raises claims of negligence and implicates the electric utility's duty of care. Why, then, has negligence not been the focus of the multiple and ongoing legal proceedings surrounding PG&E wildfires?³⁶⁴

³⁵⁵ *Id.* at 9.

³⁵⁶ *Id.* at 75.

³⁵⁷ Ark. Valley Elec. Coop. Corp. v. Davis, 800 S.W.2d 420 (Ark. 1990).

³⁵⁸ *Id.* at 421.

³⁵⁹ *Id.*

³⁶⁰ *Id.* at 422–23.

³⁶¹ *Id.* at 421, 423.

³⁶² *Id.* at 423.

³⁶³ *Id.*

³⁶⁴ We do not suggest here that a party has never alleged negligence in the context of the 2018 Camp Fire. Rather, we seek to explicate California's unique liability structure for

California is unique among states in applying the doctrine of inverse condemnation to its electric utilities. Under this doctrine, electric utilities are held “strictly liable for any wildfire caused by utility equipment regardless of standard of care or negligence.”³⁶⁵ Negligence has not been the standard, and thus, not the aim of litigation.³⁶⁶ Other jurisdictions do not similarly apply inverse condemnation to electric utilities. Other standards, most often negligence, will thus be relevant to considering a utility’s liability under a similar fact pattern.

1. To Whom Is the Duty of Care Owed?

The test to identify the beneficiary of the duty of care remains a topic of debate, largely centered on the extent an inquiry must be relational. Dueling opinions in *Palsgraf v. Long Island Railroad Co.*,³⁶⁷ provide two analytic poles. Judge Cardozo’s majority opinion conceived of duty as relational and turning on whether the aggrieved party is within the zone of foreseeable risk.³⁶⁸ An “act is negligent only with respect to specific parties and specific harms.”³⁶⁹ In contrast, in his dissenting opinion, Judge Andrews described the duty of care as being “imposed on each one of us to protect society from unnecessary danger, not to protect A, B, or C alone.”³⁷⁰ Relational inquiry is thus not central, nor instructive, to Judge Andrews’ enunciation. Analysis of these dueling theories of the duty of care is beyond the scope of this particular Article.³⁷¹ It is, however, notable that both theories require an assessment of the foreseeability of injury, which provides flexibility and malleability in analysis on the basis of evidence. Duty owed does not depend upon nor is it necessarily constrained by “contract, privity of interest or the proximity of relationship.”³⁷² Rather, facts and evidence, such as those described in Part II,³⁷³ are relevant to informing a potential plaintiff class.

electric utilities and suggest that a climate resilience claim, rather than application of inverse condemnation doctrine, is more likely relevant to other jurisdictions.

³⁶⁵ GOVERNOR’S OFF. OF PLANNING & RSCH., STATE OF CAL., FINAL REPORT OF THE COMMISSION ON CATASTROPHIC WILDFIRE COST AND RECOVERY 4 (June 17, 2019), <https://perma.cc/ZZY5-KDPQ>.

³⁶⁶ We do not suggest here that PG&E was not negligent. Others have opined at length on the utility’s actions and activities. We focus here only of the lack of its relevancy to establishing liability.

³⁶⁷ 162 N.E. 99 (N.Y. 1928).

³⁶⁸ “[N]egligence in the air, so to speak, will not do.” *Id.*

³⁶⁹ Hunter & Salzman, *supra* note 351, at 1747.

³⁷⁰ *Palsgraf*, 162 N.E. at 102.

³⁷¹ “Volumes have been written about these two opinions and volumes more no doubt will follow.” Douglas A. Kysar, *What Climate Change Can Do About Tort Law*, 41 ENV’T L. 1, 14 (2011).

³⁷² *Id.* at 10; see also John C.P. Goldberg & Benjamin C. Zipursky, *The Restatement (Third) and the Place of Duty in Negligence Law*, 54 VAND. L. REV. 657, 707 (2001) (“[T]he fact that duty is relational and relationship-sensitive does not entail the further claim that the existence of a prior relationship between defendant and plaintiff is a prerequisite to the existence of an obligation of care running from the defendant to the plaintiff.”).

³⁷³ See *supra* Section II.

Climate resilience claims are based upon an electric utility's failure to respond to the consequences of climate change. A defined set of individuals—i.e., those who experience electricity service disruptions or other adverse effects as a result of the utility's operation in the context of a climate-induced extreme weather event or change in baseline weather conditions—are at risk of harm from the utility's failure to identify and plan for the impacts of climate change. Even so, however, questions remain as to precisely to whom the electric utility owes a duty of care. Should, for example, the duty be extended to all of the electric utility's customers? Or should it be extended to any individual within the electric utility's particular service territory? Is service territory even an instructive framework, or should a different delineation be employed? Here, we turn to extreme weather tort cases to inform our analysis. As explained in greater detail in Part IV.A,³⁷⁴ we view this area of case law to be adjacent and thus particularly useful to the analysis throughout this Part.

Case law involving extreme weather torts is relatively consistent in holding that a duty of care is owed, at a minimum, to electric utility ratepayers.³⁷⁵ Whether and to what extent such a duty of care is additionally owed to non-ratepayers is less straightforward. *Strauss v. Belle Realty Co.*³⁷⁶ is an oft-cited case in this context. The case arose out of a 1977 city-wide blackout in New York City.³⁷⁷ Plaintiff Strauss injured himself falling down stairs during the blackout and argued that his injury resulted from Con Edison's negligent failure to maintain power.³⁷⁸ The court rejected the plaintiff's argument, finding that Con Edison owed no duty of care to Strauss—the plaintiff was injured in the common area of his building where electricity was provided under a contract with the building owner—not Strauss.³⁷⁹ The court premised its holding on public policy grounds:

We conclude that in the case of a blackout of a metropolis of several million residents and visitors, each in some manner necessarily affected by a 25-hour power failure, liability for injuries in a

³⁷⁴ See *supra* notes 330–337 and accompanying text.

³⁷⁵ See, e.g., *Praetorian Ins. Co. v. Long Island Power Auth.*, No. 704580/2014, 2019 N.Y. Misc. LEXIS 2952, at *11–13 (N.Y. Sup. Ct. Apr. 10, 2019) (discussing precedent in which customers were owed a duty); *Schulze v. La. Power & Light Co.*, 551 So.2d 22, 24 (La. Ct. App. 1989) (noting utilities have a duty to protect customers from sudden discontinuance of service), *writ denied*, 556 So.2d 1,280 (La. 1990); *Nat'l Food Stores, Inc. v. Union Elec. Co.*, 494 S.W.2d 379, 383 (Mo. Ct. App. 1973) (holding that a utility has a general duty to protect customers from foreseeable damage from failure of electrical service); *cf. Rehab. Ctr. at Hollywood Hills, LLC v. Fla. Power & Light Co.*, 299 So.3d 16, 20 (Fla. Dist. Ct. App. 2020) (prohibiting non-ratepayer plaintiffs on the basis that doing so would unreasonably extend utility's "zone of risk").

³⁷⁶ 482 N.E.2d 34 (N.Y. 1985).

³⁷⁷ *Id.* at 35.

³⁷⁸ *Id.*

³⁷⁹ *Id.* at 38.

building's common areas should, as a matter of public policy, be limited by the contractual relationship.³⁸⁰

The holding in *Strauss* creates specific limitations regarding who is owed a duty. Read narrowly, *Strauss* suggests that ratepayers alone are foreseeable. But the case may be better interpreted as a floor, rather than a ceiling, in determining who is owed a duty in the context of climate risk. The opinion itself leaves open this possibility, holding that “[a]s this court has long recognized, an obligation rooted in contract may engender a duty owed to those not in privity.”³⁸¹ Limiting duty based on contractual relationship is thus not premised in some legal basis, but instead was a choice based in moral values and social policies,³⁸² used “to limit the legal consequences of wrongs to a controllable degree.”³⁸³ That is, the court adopted a contractual relationship primarily to limit liability, “which could obviously be ‘enormous,’” not due to some intrinsic value in privity between parties.³⁸⁴

2. What Does the Duty of Care Entail?

The duty of care is generally understood to require an entity to not create unreasonable risk, but precise language varies depending upon the specific tort and jurisdiction. The duty in negligence cases is “to act reasonably or not to act in such a way that creates an unreasonable risk of harm.”³⁸⁵ This aspect of the duty inquiry thus centers upon “whether certain sorts of risks . . . are properly within the ambit of [the defendant’s] responsibility.”³⁸⁶

Ongoing “failure to adapt” cases, premised upon statutory violation, provide one analogue when considering what the duty of care requires in the climate resilience context. Like climate resilience claims, these cases are oriented to an entity’s failure to plan for reasonably foreseeable climate change impacts, but the statutory text, rather than tort law, informs content and obligation. *Conservation Law Foundation v. ExxonMobil Corp*³⁸⁷ and *Conservation Law Foundation v. Shell Oil*

³⁸⁰ *Id.* at 35.

³⁸¹ *Id.* at 36.

³⁸² David Owen, *Duty Rules*, 54 VAND. L. REV. 767, 778 (2001).

³⁸³ *Strauss*, 482 N.E.2d at 36 (quoting *Tobin v. Grossman*, 249 N.E.2d 419, 424 (N.Y. 1969)).

³⁸⁴ *Id.*

³⁸⁵ Hunter & Salzman, *supra* note 351, at 1748. The inquiry into the content of the duty of care provides a basis to consider whether failing to take certain actions is unreasonable, issues taken up when determining breach, discussed *infra*. See Goldberg & Zipursky, *supra* note 372, at 703–04 (“It is, of course, always *possible* to describe these cases as ‘breach’ rather than ‘duty’ cases. . . . The line between duty and breach issues is sometimes blurry.”).

³⁸⁶ Goldberg & Zipursky, *supra* note 372, at 705. Courts often conflate duty and breach by deciding questions of breach under the guise of duty. See *id.* at 712–13 (discussing the use of duty in the sense of “Breach-as-a-Matter-of-Law”).

³⁸⁷ CLF ExxonMobil Complaint, *supra* note 340.

*Products US*³⁸⁸ serve as the primary examples.³⁸⁹ In both cases, plaintiff Conservation Law Foundation (CLF) initiated still-extant citizen suits against ExxonMobil Corporation (ExxonMobil) and Shell Oil Products US (Shell), respectively, alleging the companies had violated the Resource Conservation and Recovery Act (RCRA)³⁹⁰ and the Clean Water Act (CWA)³⁹¹ by failing to incorporate known climate change-induced risks into their required permitting application under the statutes.³⁹² Specifically, the suits allege that ExxonMobil and Shell failed to account for climate change-induced effects—such as sea level rise, increased precipitation, increased magnitude and frequency of storm events and storm surges, and lack of preventative infrastructure—in their statutorily required stormwater pollution prevention plans (SWPPPs), spill prevention, control and countermeasure plans, and facility response programs for their terminals in Massachusetts and Rhode Island (respectively).³⁹³ Of particular import, the statutorily required plans must be made in accordance with “good engineering practices,” but CLF contends the ExxonMobil and Shell SWPPPs “w[ere] not prepared based on information regarding climate change-induced impacts known to reasonably prudent engineers.”³⁹⁴ The complaints assert that ExxonMobil and Shell knew of these impacts, but failed to design and implement protective measures to fortify their terminals as required by federal law.³⁹⁵

³⁸⁸ CLF Shell Complaint, *supra* note 340.

³⁸⁹ CLF ExxonMobil Complaint, *supra* note 340, at 1, 7, 9; CLF Shell Complaint, *supra* note 340, at 1, 4–5.

³⁹⁰ Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§ 6901–6992k (2018) (amending Solid Waste Disposal Act, Pub. L. No. 89–272, 79 Stat. 992 (1965)).

³⁹¹ Federal Water Pollution Control Act, 33 U.S.C. §§ 1251–1388 (2018).

³⁹² CLF ExxonMobil Complaint, *supra* note 340, at 1, 5, 7, 9; CLF Shell Complaint, *supra* note 340, at 1, 4–5. The case against ExxonMobil remains undecided and is currently subject to a federal primary jurisdiction doctrine dispute, concerning whether EPA should have an opportunity to review the permit through the ongoing permit renewal process. In March 2020, the district court granted ExxonMobil’s request for a stay until EPA makes a determination on the renewal. *Conservation Law Found. v. ExxonMobil Corp.*, 448 F. Supp.3d 7, 12, 26 (D. Mass. 2020), *appeal docketed*, No. 20-1456 (1st Cir. Apr. 27, 2020). The stay is now on appeal before the First Circuit Court of Appeals. *See* Notice of Appeal, *Conservation Law Found. v. ExxonMobil Corp.*, No. 1:16-cv-11950-MLW (D. Mass. Apr. 17, 2020). This inquiry is closely related to questions of forum discussed in detail in Part V.A, below. *See infra* Part V.A. The case against Shell survived a motion to dismiss and has advanced to the discovery phase, with the court rejecting primary jurisdiction and abstention arguments. Memorandum and Order at 11, *Conservation Law Found. v. Shell Oil Prod. US*, No. 17-396 WES, 2020 WL 5775874, at *4 (D.R.I. Sept. 28, 2020) [hereinafter *CLF v. Shell Memorandum & Order*].

³⁹³ CLF ExxonMobil Complaint, *supra* note 340, at 1, 15, 17; CLF Shell Complaint, *supra* note 340, at 1, 4.

³⁹⁴ CLF ExxonMobil Complaint, *supra* note 340, at 59; *see also* CLF Shell Complaint, *supra* note 340, at 62 (noting that “[t]he SWPPP was not prepared based on information known to reasonably prudent engineers”).

³⁹⁵ CLF ExxonMobil Complaint, *supra* note 340, at 1, 31; CLF Shell Complaint, *supra* note 340, at 1, 4–5.

The interplay between climate risk and possible statutory claims is beyond the scope of this Article, and remains an important area in need of further research. Relevant here, however, is how such claims might provide a model for the duty of care in a climate resilience claim. In both CLF lawsuits, the courts must consider whether the defendants violated the requirements of their permits by failing to consider the known risk of foreseeable climate change impacts. Climate resilience claims would turn on a similar question: whether electric utilities must consider, as part of their duty of care, the known risk of foreseeable climate change impacts on their assets and operations. An electric utility's duty of care requires one "to act reasonably or not to act in such a way that creates an unreasonable risk of harm."³⁹⁶ As demonstrated in Part II, climate change impacts on electric utilities' assets and operations are increasingly knowable, as are the consequent risks of harm to utility customers.³⁹⁷ A reasonable and logical—a prudent—electric utility would integrate climate risk into decision-making.³⁹⁸ Addressing climate risk through resilience planning may be within the ambit of an electric utility's responsibility.

Elucidating with a high-degree of precision and uniformity what the duty of care entails may prove challenging, however, in a climate resilience claim. Two tort cases brought against electric utilities in connection with extreme weather events highlight different ways that courts have approached a similar inquiry. First, in *Praetorian Insurance Co. v. Long Island Power Authority*,³⁹⁹ a New York court was asked to consider relatively novel questions of duty in the aftermath of Superstorm Sandy.⁴⁰⁰ Plaintiffs in the case, still ongoing at the time of writing, alleged that the storm had resulted in the loss and destruction of their properties through a confluence of flooding and energized wiring and that the electric utility had a duty to de-energize lines before a storm.⁴⁰¹ The court held that electric utilities are "under a duty to exercise reasonable care in the supply of electric service."⁴⁰² Electric utilities must exercise that duty in a way "commensurate with the inherent danger hidden in its high voltage equipment."⁴⁰³ The court avoided answering "whether

³⁹⁶ Hunter & Salzman, *supra* note 351, at 1748.

³⁹⁷ See *supra* Part II.C.

³⁹⁸ See *supra* Part III.A.1 (noting the prudence standard should require utilities to evaluate and manage known climate risks when making decisions).

³⁹⁹ *Praetorian Ins. Co. v. Long Island Power Auth.*, No. 704580/2014, 2019 N.Y. Misc. LEXIS 2952 (N.Y. Sup. Ct. Apr. 10, 2019).

⁴⁰⁰ *Id.*

⁴⁰¹ *Id.* at *3–4.

⁴⁰² *Id.* at *20.

⁴⁰³ *Id.* at *21. This potentially "heightened" duty that electric utilities are under is a common theme throughout negligence claims against utilities. Case law in many states recognizes a heightened duty of care commensurate with proper operation and maintenance of electric systems. See, e.g., *Ala. Power Co. v. Jackson*, 166 So. 692, 693 (Ala. 1935) (noting there is a duty arising from operating "transmission lines charged with a dangerous agency or power"); *Citerella v. United Illuminating Co.*, 266 A.2d 382, 386 (Conn. 1969) (describing the duty imposed upon one in the electric business to be that of "the highest degree of care

defendants, having been able to de-energize [its power lines ahead of Superstorm Sandy], ‘acted with the degree of care which was commensurate with the risk to which it had exposed’ the Plaintiffs.”⁴⁰⁴ The court viewed that as a question of breach to be answered by the jury.⁴⁰⁵ Similarly, in considering a climate resilience claim, a court might conclude that the duty is to take reasonable action commensurate to the risk to the plaintiff (of outages, for example) and then allow a jury to determine whether the utility, having failed to undertake feasible climate resilience planning, acted with the appropriate degree of care.

A New Jersey court approached this inquiry in a similar case with a different result. In *Roudi v. Jersey Central Power & Light*,⁴⁰⁶ the same conduct and harm was alleged as in *Praetorian*: the electric utility had failed to de-energize its lines ahead of Superstorm Sandy, causing fires that damaged plaintiffs’ homes.⁴⁰⁷ Here, however, the court did not see preemptive de-energizing as a matter of breach of the duty of reasonable care; instead, it assessed whether it should recognize and impose a wholly new duty to preemptively de-energize.⁴⁰⁸ The court concluded there could be no such “far-reaching duty,” emphasizing various policy considerations relied upon by the lower court, including the “crushing burden” the duty would place on the utility.⁴⁰⁹ This case illustrates a different approach to defining what the duty of care entails in a climate resilience claim.⁴¹⁰ If a court views climate resilience planning as a duty in and of itself, it might examine how far-reaching that duty would be and the burden it would place on the utility. Notably, should a court adopt this approach, it does not necessarily follow that the outcome of such a case would replicate *Roudi*. Rather, it suggests that the scope of the court’s review would similarly focus inquiry under the analysis of duty.

and skill”); *Miss. Power & Light Co. v. Shepard*, 285 So.2d 725, 729 (Miss. 1973) (stating “a distributor of electricity must observe . . . a very high degree of care” that “increases as the danger increases”).

⁴⁰⁴ *Praetorian*, 2019 N.Y. Misc. LEXIS 2952, at *21.

⁴⁰⁵ *Id.*

⁴⁰⁶ *Roudi v. Jersey Cent. Power & Light*, No. A-1505-18T1, 2020 WL 1650710 (N.J. Super. Ct. App. Div. 2020).

⁴⁰⁷ *Id.* at *1.

⁴⁰⁸ *Id.* at *3–6.

⁴⁰⁹ *See id.* at *5–7 (finding a duty to pre-preemptively suspend electric service was too far-reaching considering the utility’s duty to provide uninterrupted service and the lack of actual notice of danger to a particular area).

⁴¹⁰ The court’s approach in *Praetorian* appears to more closely aligns with the Restatement’s primary sense of duty, which asks “whether [the] defendant was obligated to act with due regard” toward the plaintiff. *See Goldberg & Zipursky, supra* note 372, at 699–700, 713 (citing RESTATEMENT (SECOND) OF TORTS § 4 (AM. LAW. INST. 1965)) (discussing the question of duty as set out by the Second Restatement of Torts and further interpreted by courts).

Box 10: Potentially Available Claims and Duties

This Part centers analysis of duty and breach upon theories of negligence and duty of care. However, additional claims and duties may be relevant, including: 1) Product liability claims, where the duty of care is defined as obligation “to avoid selling a defective product or one that is unaccompanied by an adequate warning.”⁴¹¹ 2) Private nuisance claims, which prohibit defendants from “interfer[ing] unreasonably or knowingly with the use and enjoyment of another’s property.”⁴¹² 3) Public nuisance claims, where the duty of care requires a defendant “not to contribute unreasonably or knowingly to an interference with the public’s resources.”⁴¹³ 4) Statutory claims, where duty is defined in law.⁴¹⁴ One example might be the electric utilities’ statutory duty to serve, which, unlike the duty of care, is based upon the grant of monopoly franchise and requires an electric utility to extend and maintain adequate service.⁴¹⁵

C. Breach of Duty

Courts most often employ four key approaches to determine whether a duty of care, once established, has been breached: risk-utility analysis, the multi-factor balancing test, industry custom, and public policy considerations. Each is explored in turn, below. We find that breach, in a climate resilience claim, is cognizable through each approach identified.

1. Risk-Utility Analysis

Risk-utility analysis considers whether “the burden of preventing injury is less than the product of the magnitude of the injury and its likelihood.”⁴¹⁶ The *Restatement (Second) of Torts* describes this analysis as:

Where an act is one which a reasonable man would recognize as involving a risk of harm to another, the risk is unreasonable and the act is negligent if the risk is of such magnitude as to outweigh what the law regards as the utility of the act or of the particular manner in which it is done.⁴¹⁷

⁴¹¹ Hunter & Salzman, *supra* note 351, at 1749.

⁴¹² *Id.*

⁴¹³ *Id.*

⁴¹⁴ *See, e.g.*, CLF ExxonMobil Complaint, *supra* note 341, at 2 (alleging defendants failed to comply with statutorily defined duties under the CWA and its discharge permit); CLF Shell Complaint, *supra* note 341, at 68 (alleging defendants failed to comply with its discharge permit issued under the CWA).

⁴¹⁵ *See generally* Rossi, *The Common Law “Duty to Serve,” supra* note 310, at 1237–38 (discussing the contours of the utility’s duty to serve).

⁴¹⁶ Hunter & Salzman, *supra* note 351, at 1756.

⁴¹⁷ RESTATEMENT (SECOND) OF TORTS § 291 (AM. LAW. INST. 1965).

In a climate resilience claim, the product of the magnitude of injury (i.e., to life and property from climate-induced outages and other harms) and likelihood of harm (variable by location, but nowhere in the U.S. is immune) would be weighed against the burden of preventing injury (i.e., by conducting climate resilience planning and making resilience investments).⁴¹⁸ Climate change impacts are significant and foreseeable, and costs continue to grow as climate change increasingly results in more frequent, severe, and intense extreme weather events and marked changes in non-event weather patterns (e.g., higher average temperatures).⁴¹⁹ A court, in employing risk-utility analysis, thus has significant evidence to draw from to support a finding of breach. Scales will tip only further as the consequences of climate change increase in severity and the magnitude of harm becomes greater.⁴²⁰ Planning may reveal methods to reduce injury through operational changes rather than new, significant, and additional expenditures. Such methods would reduce the burden on the defendant of preventing injury. There is mounting evidence that the cost of implementing resilience measures today will be less than the cost of injury from outages that will occur in the future, for example, in terms of value of lost load due to climate change impacts.⁴²¹ The risk-utility analysis thus increasingly favors engaging in climate resilience planning and making resilience investments now, and that a failure to do so breaches an electric utility's duty of care.

2. Multi-Factor Balancing Test

A second approach the courts employ in assessing breach is the multi-factor balancing test. Here, a court would consider additional elements beyond simply balancing the burden of avoidance against the likely damage, including 1) the foreseeability and degree of certainty of harm, 2) the goal of using tort law as a deterrent for future harm, 3) the burden on the defendant, and 4) the consequences to the community of imposing a duty.⁴²²

⁴¹⁸ See generally Al Shaw & Jeremy W. Goldsmith, *New Climate Maps Show a Transformed United States*, PROPUBLICA (Sept. 15, 2020), <https://perma.cc/J5NG-J6H2> (describing how climate change impacts will shift across regions of the U.S.); see generally Benjamin DeAngelo et al., CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT 393 (Donald J. Wuebbles et al., eds., 2017), <https://perma.cc/38T7-8ZJ7> (discussing plans for mitigation, including the costs and risks).

⁴¹⁹ CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT, *supra* note 418, at 76, 94–96.

⁴²⁰ See generally *id.* at 73, 95–96 (noting warming will continue to increase in the coming decades as positive feedback loops outweigh negative feedback loops).

⁴²¹ See *supra* Parts II and III.A.3.

⁴²² Hunter & Salzman, *supra* note 351, at 1768–69 (providing a list of factors considered by a federal court in California in determining the duty of care). The Third Restatement also touches upon several of these concepts. See RESTATEMENT (THIRD) OF TORTS § 3 (AM. L. INST. 2010) (noting that to determine whether a person's conduct lacks reasonable care

The multi-factor balancing test's additional considerations generally favor a finding that failure to adequately prepare for the impacts of climate change may constitute a breach of a utility's duty of care. For example: 1) Foreseeability and degree of certainty of harm are both increasingly supported by ever-sharpening climate science and granular, down-scaled data analysis. 2) Imposing liability for failure to prepare for climate change may well deter future harm by spurring proactive resilience planning. 3) The burden to electric utilities of engaging in climate resilience planning is likely to be modest as any costs associated could be structured similarly to how risks are traditionally allocated. Although consideration of climate change is not within the traditional role of an electric utility, risk assessment is a foundational aspect of electric utility planning and thus whatever additional effort climate resilience planning may require may be supported through existing processes. 4) Ratepayers, at the very least, and likely any individual within a given service area, would benefit, insofar as improved climate resilience planning results in reduced harm to person and property through at least the entirety of a utility's franchise area. Predicted benefits would, however, be evaluated in the context of expected rate impacts.

3. Industry Custom

Industry custom may aid in establishing breach, with the courts considering the practices of the relevant industry to assess the scope of the duty and comparing that to the defendant's own conduct.⁴²³ However, as made clear in *The T.J. Hooper v. Northern Barge Corp.*,⁴²⁴ industry custom is not controlling, and only girds against breach to the extent that custom itself is reasonable.⁴²⁵ In *Hooper*, the plaintiffs' barges, towed by the defendant's tugboats, were lost at sea during a storm.⁴²⁶ Plaintiffs alleged that the defendant was negligent in failing to provide the tugboats with radios which would have provided advanced warning of the oncoming storm.⁴²⁷ The defendant argued that no industry custom nor legal requirement existed to obligate it to ensure radios were installed.⁴²⁸ The court, in finding for the plaintiffs, held that industry custom was not a shield against liability in the case at hand because "there are precautions so imperative that even their universal disregard will not excuse their omission."⁴²⁹

requires a balancing of the foreseeability of the harm and "the burden of precautions to eliminate or reduce the risk of harm," among other things).

⁴²³ Hunter & Salzman, *supra* note 351, at 1776–77.

⁴²⁴ *The T.J. Hooper v. N. Barge Corp.*, 60 F.2d 737 (2d Cir. 1932).

⁴²⁵ *Id.* at 740.

⁴²⁶ *Id.* at 737.

⁴²⁷ *Id.*

⁴²⁸ *Id.* at 740.

⁴²⁹ *Id.*

Nor is industry custom static; it necessarily changes as technology and science improve. There may be situations where “a whole calling may have unduly lagged in the adoption of new and available devices.”⁴³⁰ In such a case, the whole industry would have failed to adopt reasonable measures for preventing risk, and thus a showing of industry custom would provide no defense to a defendant’s breach.

As explored in more detail in Part II.C above, electric utilities have until recently not robustly engaged in climate resilience planning.⁴³¹ Indeed, this Article is a reflection of the need to advance industry efforts to keep pace with the best available science, evidence, and practical experience. There are, however, signs that industry custom is changing. In recent years, several electric utilities have engaged in climate resilience planning, and others have acknowledged the need to do so.⁴³² Several state utility commissions have also recognized the relevance of climate change to the sector it regulates.⁴³³ Con Ed’s Climate Study has demonstrated that climate resilience planning is feasible and provides vital information about how climate change will impact assets and operations. It is already being held up as industry standard in other rate cases, and at least two other electric utilities have already agreed to undertake similar assessments.⁴³⁴ Electric utilities that fail to follow suit

⁴³⁰ *Id.*

⁴³¹ See *supra* notes 111–113 and accompanying text.

⁴³² Electric utilities in California, for example, have recognized the need to further study the impacts of climate change on their assets and operations. See *supra* Part II.C.1.

⁴³³ See, e.g., CONSOLIDATED EDISON, *supra* note 47, at 1–2, 4 (summarizing a study of potential risks to Consolidated Edison’s “operations, planning, and physical assets” as a result of climate change); N.J. Exec. Order No. 89, *supra* note 298, at 1, 3–4 (Executive Order by the Governor of New Jersey identifying climate change as a threat to the state’s public health and safety and establishing an Interagency Council on Climate Resilience, to include a representative from the Board of Utilities); Cal. Pub. Utils. Comm’n, *supra* note 164, at 2 (“This decision takes steps to ensure the energy utilities we regulate are prepared to upgrade their infrastructure, operations and services to adapt to climate change, and to ensure safe and reliable energy service to all Californians.”); N.Y. Pub. Serv. Comm’n, Order Instituting Proceeding, Case 20-M-0499 at 1 (Oct. 15, 2020) (“For public utilities, with significant assets and changing physical infrastructure needs, increased transparency of climate-related financial risks would allow better planning and investment consistent with the State’s climate goal of a carbon neutral economy by 2050.”); see also CFTC REPORT, *supra* note 13, at 14–15, 18, 32, 76 (noting that the U.S.’s aging power infrastructure is vulnerable to the impacts of climate change and that this presents significant financial risk to regulated utilities and financial markets and institutions).

⁴³⁴ Vote Solar DEC Testimony, *supra* note 128, at 53 (noting that “[t]he work of the New York Storm Hardening & Resiliency Collaborative,” which includes Con Ed, “represents a best practice in the industry.”); Vote Solar DEP Testimony, *supra* note 244, at 56 (noting that Con Ed’s climate risk vulnerability study and its “use of the best available climate science . . . represents a step forward for the industry.”); DEC Settlement Agreement, *supra* note 248, at 4 (Duke Energy Carolinas agrees to “convene a Climate Risk & Resilience Working Group . . . to consult and collaborate with interested parties to” guide the utility’s study of the “impacts of climate change on the Company’s [Grid Improvement Plan] and existing grid.”); DEP Settlement Agreement, *supra* note 247, at 4 (Duke Energy Progress agrees to the same).

could be considered “laggards” in breach of a growing industry custom.⁴³⁵ Additionally, climate resilience planning has been widely supported and recommended by government and industry bodies, suggesting that it is a practice “so imperative that even [its] universal disregard will not excuse [its] omission.”⁴³⁶

4. Public Policy Considerations

Breach may also be informed by public policy considerations, which are relevant to identifying duty in certain instances, as illustrated in *Strauss* and *Roudi*.⁴³⁷ Here, just as overriding policy concerns might persuade a court not to impose a duty, it might also prompt a judge to forego a finding of breach “out of concern that the scale of liability will be so large as to run counter to public policy.”⁴³⁸ In particular, courts may find a reason to limit breach out of concern that not doing so would create limitless liability for the defendant. That concern would, however, be less persuasive where plaintiffs are limited to electric utility ratepayers.

Box 11: Breach and Specific Conduct

Precision is necessary in defining what constitutes a breach. That is, the specific conduct and particularity of an alleged breach matters. In *Praetorian*, discussed above, the court rejected public policy reasons why no duty should be imposed and, if there is a duty, why no breach was found.⁴³⁹ The court concluded it was up to the trier of fact to determine whether failing to de-energize lines, even though it had the ability to do so, amounted to a breach of the electric utility’s duty to exercise reasonable care—whether the electric utility had “acted with the degree of care which was commensurate with the risk to which it had exposed.”⁴⁴⁰

A similar degree of specificity would be necessary in informing what constitutes a breach in a climate resilience claim. In theory, various electric utility actions (or failures to act) could support a finding of breach, such as: 1) failure to build or raise assets at a level outside the zone of flooding likely to occur given the foreseeable increased storm surge due to climate change; and 2) failure to account for climate change-amplified temperature rise when purchasing infrastructure built to operate at certain temperatures.

Reasonably foreseeable planning practices that can be implemented when the utility conducts a risk assessment provide accurate projections of what its service territory will look like in a changed climate and the

⁴³⁵ Hunter & Salzman, *supra* note 351, at 1794.

⁴³⁶ *The T.J. Hooper v. N. Barge Corp.*, 60 F.2d 737, 740 (2d Cir. 1932).

⁴³⁷ *Strauss v. Belle Realty Co.*, 482 N.E.2d 34 (N.Y. 1985); *Roudi v. Jersey Cent. Power & Light*, No. A-1505-18T1, 2020 WL 1650710 (N.J. Super. Ct. App. Div. 2020).

⁴³⁸ Hunter & Salzman, *supra* note 351, at 1781.

⁴³⁹ *Praetorian Ins. Co. v. Long Island Power Auth.*, No. 704580/2014, 2019 N.Y. Misc. LEXIS 2952, at *16–21 (N.Y. Sup. Ct. Apr. 10, 2019).

⁴⁴⁰ *Id.* at *20–21 (quoting *Tallarico v. Long Is. Light Co.*, 358 N.Y.S.2d 442, 444 (N.Y.2d 1974)).

physical impacts that climate change will have on owned infrastructure. The failure to engage in such practices could thus serve as a specific conduct that would inform whether the duty of care was breached.

D. Causation

Tort law requires that the plaintiff's harm is linked through some cause-and-effect relationship to the defendant's negligent conduct. This causation requirement includes two analytic prongs: 1) cause-in-fact and 2) proximate, or legal, cause.⁴⁴¹

1. Cause-in-Fact

Cause-in-fact is most often determined through the “but for” test. This test is met only on the finding that “the harm would have not occurred *but for* the defendant's negligence.”⁴⁴² The defendant's negligent conduct must be a necessary cause of the harm; it must be “at least partially to blame.”⁴⁴³

Climate change claims premised upon a defendant's production and sale of fossil fuels have relied upon careful collection and reflection of scientific evidence and study.⁴⁴⁴ This is particularly true with respect to the causation element, which first required establishing the existence of the anthropogenic greenhouse gas effect. Given that “it is fair to say that global warming may be the most carefully and fully studied scientific topic in human history,” this causal connection has been well-established.⁴⁴⁵ This same basis is also necessary to climate resilience claims, which likewise must premise any causal chain first upon evidence of increasing climate change. Although such causal linkage in a climate resilience claim may require specific and particularized climate impacts to that utility's service territory, downscaled climate projections, as described in Part II, make such information attainable.⁴⁴⁶

From here, however, paths diverge. Tort litigation premised on an entity's contribution to climate change generally next considers questions of scale and attribution, linking the defendant's conduct, e.g., the production and sale of fossil fuels, to a specific set of harms.⁴⁴⁷ These

⁴⁴¹ David G. Owen, *The Five Elements of Negligence*, 35 HOFSTRA L. REV. 1671, 1673–74 (2007).

⁴⁴² *Id.* at 1680. In some instances, cause-in-fact is established using the substantial factor test, although this is generally reserved “for situations where multiple events combine to cause an injury that would have occurred even if one of them were removed.” *Id.* at 1681.

⁴⁴³ *Id.* at 1680.

⁴⁴⁴ Hunter & Salzman, *supra* note 351, at 1763–64.

⁴⁴⁵ Kysar, *supra* note 371, at 29–30.

⁴⁴⁶ *See supra* notes 42–63 and accompanying text.

⁴⁴⁷ *See supra* notes 30–31 and accompanying text; *see also* Michael Burger, Jessica Wentz & Radley Horton, *The Law and Science of Climate Change Attribution*, 45 COLUM. J. ENV'T L. 57, 199–200 (2020) (noting courts have granted standing based on showing emissions made a “meaningful contribution” to climate change).

inquiries are relevant to the cause-in-fact analysis. Climate resilience claims, however, focus causality on a different chain: the linkage between a defendant's failure to reasonably plan for the increasingly severe and frequent consequences of climate change to owned infrastructure and harms that result. Take, as an example, outages after Superstorm Sandy in New York City—Con Ed's service territory. Assume the outages occurred because a piece of equipment was in the flood zone, and was rendered inoperable by storm surge. Before the storm, Con Ed built its assets based on an assumed 12.5-foot storm surge, which was derived from the historical record.⁴⁴⁸ This assumed storm surge was incorrect, as historic data did not account for the impacts of climate change. Had Con Ed engaged in climate resilience planning, it would presumably have identified a different set of assumptions that were more accurate.

This fact pattern could potentially give rise to an extreme weather tort claim. A plaintiff might allege, for example, that the electric utility's emergency preparations immediately prior to the storm were insufficient. The fact pattern might additionally give rise to a climate resilience claim. Here, a climate resilience claim might focus on the sufficiency of the electric utility's actions in incorporating foreseeable climate change impacts to its long-term planning, processes, and risk assessments. It might assert, for example, that but for Con Ed's decision not to conduct a climate risk assessment and identify reasonably foreseeable consequences of climate change like higher storm surges, assets would not have been placed in flood prone areas. That is, the utility's failure to engage in climate resilience planning—is at least partially to blame for the assets being rendered inoperable by flooding and the consequent outages, and thus a “but for” or “necessary” cause of the harm.

2. Proximate Cause

“[P]roximate cause addresses . . . the question of whether in logic, fairness, policy, and practicality, the defendant ought to be held legally accountable for the plaintiff's harm that in some manner is ‘remote’ from the defendant's breach.”⁴⁴⁹ Defined as the “reasonably close connection between a defendant's wrong and the plaintiff's injury,” proximate cause provides limitation to defendant liability.⁴⁵⁰ The concept of foreseeability is central to determining proximate cause, premised on the theory that “responsibility for consequences should be based on the quality of an actor's choices that led to the consequences. The moral fiber of such choices is gauged by consequences the actor should have contemplated as plausible eventualities at the time the choice was made.”⁴⁵¹ Proximate

⁴⁴⁸ Van Nostrand, *supra* note 209, at 101.

⁴⁴⁹ Owen, *supra* note 441, at 1681.

⁴⁵⁰ *Id.* at 1681–82.

⁴⁵¹ *Id.* at 1683.

cause will not be found when the “defendant’s negligence appear[s] simply too attenuated” or “tenuous or ‘remote.’”⁴⁵²

Extreme weather tort cases again are instructive in considering causation. Similar questions of foreseeability emerge, as the remoteness of the causal chain is often central to court inquiry. Extreme weather tort cases are, however, surprisingly sparse and outcomes are uneven. As a general rule, precedent often collapses both prongs of the causality analysis or centers only on proximate cause. Analysis generally turns upon the foreseeability of the plaintiff’s harm in connection to the defendant’s breach of duty. *Praetorian* serves as one example. In dismissing the defendant’s motion for summary judgment, the court held that “the foreseeability of harm to the plaintiffs was clear. There were ample weather reports of the approach of Superstorm Sandy and about the great surges that would occur. The dangers of flood waters coming into contact with live electric power were well known in the utility industry.”⁴⁵³

A similar analysis is embedded in *National Food Stores, Inc. v. Union Electric Co.*⁴⁵⁴ There, plaintiff National Food Stores alleged that the electric utility defendant was liable for the loss of foodstuffs, caused by an electricity outage during a summer heat wave. Although the case was premised on a duty to serve and the defendant’s failure to provide notice of an impending outage, rather than duty of care, the causation analysis proceeded similarly, with the court oriented again to the foreseeability of the harm. Whether the utility should have been aware of looming outage was central. In ruling in favor of the plaintiff, the court contrasted precedent where an outage was “caused by external forces outside the control of the power company, which were not reasonably foreseeable,” with the case at hand, where the utility “was well aware of the unprecedented demand upon its facilities.”⁴⁵⁵ In the latter situation, the utility’s negligence is a legal cause that is not excused because of the presence of external forces at play.

Applying this precedent to a climate resilience claim, establishing proximate cause will require a showing that it was reasonably foreseeable that particular climate impacts would occur in particular areas and that, unless the electric utility implemented appropriate resilience measures, those impacts would lead to outages. As discussed in Part II, downscaled climate projections can be used to identify local climate impacts, and their likely consequences for electric utility operations assessed through the climate resilience planning process.⁴⁵⁶ Indeed, as the Con Ed Climate

⁴⁵² *Id.* at 1683–84.

⁴⁵³ *Praetorian Ins. Co. v. Long Island Power Auth.*, No. 704580/2014, 2019 N.Y. Misc. LEXIS 2952, at *20 (N.Y. Sup. Ct. Apr. 10, 2019).

⁴⁵⁴ 494 S.W.2d 379 (Mo. Ct. App. 1973) (considering whether a utility breached the duty to avoid unreasonable risks to customer’s property by failing to give notice of an interruption to service caused by an emergency situation).

⁴⁵⁵ *Id.* at 382–84.

⁴⁵⁶ *See infra* Part II.A, notes 43–48 and accompanying text.

Study demonstrates, electric utilities have the ability to uncover climate vulnerabilities within their systems and take appropriate remedial action.⁴⁵⁷ To the extent other electric utilities fail to undertake and periodically update similar studies, any outages resulting from climate-induced phenomena are arguably not only caused by climate change—an external event—but also by the utility’s failure to appropriately prepare for it. The electric utility’s negligence in failing to conduct climate resilience planning is a proximate cause for which it can be held liable in tort.

E. Harm

As stated at the outset of this Part, a climate resilience claim arises from an electric utility’s failure to adequately prepare for reasonably foreseeable event- and non-event-based climate impacts to owned assets, operations, or both where that failure results in cognizable harm. While state utility commissions will often consider climate resilience in the context of future climate impacts, climate resilience claims before a court, like the majority of tort law claims, will generally center upon past events.⁴⁵⁸

Cognizable harm could include a variety of injuries. Borrowing from extreme weather case law, harm to person and property both appear to be cognizable harms. In *Praetorian* and *National Food*, plaintiffs brought suit on the basis of property loss.⁴⁵⁹ Other cases have been based on physical harm to individuals, for example, from downed power lines.⁴⁶⁰ Harm may thus include injury to persons or property damage resulting from electricity service outages, for example where a heat wave forces curtailment of output from a thermoelectric generating plant, triggering an outage that results in a blackout at a frozen foods warehouse, leading to spoilage. Climate resilience claims might also, however, arise in situations where the harm (e.g., personal injury or property damage) is not directly connected to, or the result of, a service outage. Like in *Arkansas Valley Electric*, where litigation resulted from contact and injury with a downed power line, harm resulting from the electric utility’s equipment, operation, or asset directly (i.e., rather than a subsequent forced outage) is a potential additional basis for a climate resilience

⁴⁵⁷ See CONSOLIDATED EDISON, *supra* note 47, at 3 (concluding that Consolidated Edison’s three energy systems were vulnerable to flooding and the electric system was “vulnerable to heat waves and overhead storms”).

⁴⁵⁸ Note, however, that this should not be read to foreclose potential cases brought on different theories of harm or injury.

⁴⁵⁹ *Praetorian Ins. Co. v. Long Island Power Auth.*, No. 704580/2014, 2019 N.Y. Misc. LEXIS 2952, at *4 (N.Y. Sup. Ct. Apr. 10, 2019); *Nat’l Food Stores, Inc. v. Union Elec. Co.*, 494 S.W.2d 379, 380 (Mo. Ct. App. 1973).

⁴⁶⁰ See, e.g., *Ark. Valley Elec. Coop. Corp. v. Davis*, 800 S.W.2d 420 (Ark. 1990) (negligence action against utility for failing to replace a deteriorated pole which had been downed in a tornado).

claim.⁴⁶¹ One example might be where transmission line sag results in a wildfire, which leads to loss of life and property damage.

V. INTERPLAY BETWEEN STATE UTILITY COMMISSIONS AND COURTS

Parts III and IV detail two pathways for advancing climate resilience planning by electric utilities—one before state utility commissions and the other in state court.⁴⁶² Although these two approaches generally raise different temporal issues—that is, prospective compared to retrospective action—interplay and overlap necessarily exists. This Part considers the interaction between the pathways, with a focus upon how state utility commission and state court proceedings may intersect. Specifically, this Part considers how a climate resilience claim brought against an electric utility implicates the jurisdiction of both state utility commissions and civil courts, and the law governing each body’s role in reviewing such a claim.

This Part proceeds in three subparts. First, it addresses issues of primary jurisdiction and exhaustion to provide an understanding of where climate resilience claims likely will be heard in the first instance.⁴⁶³ Second, it describes the relevance of state utility commission findings in “collateral” civil litigation where claims related to commission proceedings are raised.⁴⁶⁴ Third, it identifies instances where limitation of liability provisions in electric utility tariffs may apply.⁴⁶⁵ In each of these areas, there is variability among states, since each has its own body of law and judicial doctrines. Original research was conducted to elucidate these state differences. This Part’s analysis relies upon that work to identify and analyze variability between states.

A. Proper Forum: Primary Jurisdiction and Exhaustion

Climate resilience claims involve factual and legal issues that may be relevant to both state utility commission and state court proceedings. Questions of proper forum necessarily emerge, as it is not immediately clear in all instances whether the state court or state utility commission should consider climate resilience claims in the first instance.⁴⁶⁶ As a general rule, civil courts most often serve as the forum for tort law claims against electric utilities, particularly where only questions of law exist.⁴⁶⁷

⁴⁶¹ *Id.*

⁴⁶² *See supra* Parts III and IV.

⁴⁶³ *See infra* Part V.A.

⁴⁶⁴ *See infra* Part V.B.

⁴⁶⁵ *See infra* Part V.C.

⁴⁶⁶ Notably, this question may not be present in other contexts. Electric utilities are closely regulated, resulting in extensive agency jurisdiction, and thus important considerations of forum exist. This may not be true for other professions and industries, and thus questions of forum will be less relevant in those contexts.

⁴⁶⁷ *See, e.g.,* *Hamilton v. United Tel. Co. of Kan., Inc.*, 636 P.2d 202, 204 (Kan. Ct. App. 1981) (finding it appropriate for courts to decide actions against public utilities where the

Conversely, claims relating to the rates charged and services provided by electric utilities generally fall within the jurisdiction of the state utility commission.⁴⁶⁸ Issues raised in climate resilience claims, where there is some alleged failure on the part of the electric utility to fulfill a planning obligation, fall somewhere between these two, creating thorny question of proper forum. Such a claim might “sound in” tort, as described in Part IV,⁴⁶⁹ but might also implicate issues of rates and services, like those discussed in Part III.⁴⁷⁰

Two doctrines are particularly relevant to the proper forum inquiry: primary jurisdiction and exhaustion of administrative remedies. While distinct doctrines, courts often muddle the two or even use them interchangeably.⁴⁷¹ Primary jurisdiction doctrine is a prudential doctrine that courts may invoke where a claim is originally cognizable by both a trial court and an administrative agency.⁴⁷² When the doctrine is invoked, a court may abstain from hearing the claim and refer it to the relevant agency for determination in the first instance.⁴⁷³ Exhaustion doctrine, on the other hand, is a non-discretionary rule requiring a party to initiate its claims before an administrative agency.⁴⁷⁴ The claim can only be heard by the judiciary through appellate review after the agency has made a

question is “inherently judicial, i.e., was there breach of contract? Was there negligence?”); *see also, e.g.*, *Schuster v. Nw. Energy Co.*, 314 P.3d 650, 652 (Mont. 2013) (finding the public utility commission had no authority to decide a negligence action involving the “legal rights and responsibilities of . . . part[ies]”); *see also infra* notes 504–507 and accompanying text (explaining that “courts often consider the relative expertise of each potential adjudicator” when assessing jurisdiction and presume to have expertise in handling claims that fall into their conventional jurisdiction, such as tort law or statutory construction issues).

⁴⁶⁸ *See, e.g.*, *Daily Advertiser v. Trans-La*, 612 So.2d 7, 17 (La. 1993) (noting a public utility commission had statutorily established jurisdiction over issues regarding rates and services); *Sheffler v. Commonwealth Edison Co.*, 923 N.E.2d 1259, 1276 (Ill. App. Ct. 2010); *Nev. Power Co. v. Eighth Jud. Dist. Ct. of Nev.*, 102 P.3d 578, 584 (Nev. 2004); *see also infra* notes 492–493 and accompanying text.

⁴⁶⁹ *See supra* notes 348–461 and accompanying text.

⁴⁷⁰ *See supra* Part III.

⁴⁷¹ Paula Knippa, *Primary Jurisdiction Doctrine and the Circumforaneous Litigant*, 85 TEX. L. REV. 1289, 1291–92 (2007).

⁴⁷² *Id.* at 1290 (“The development of the primary jurisdiction doctrine is a function of the judiciary’s recognition that the adjudicatory authority of regulatory agencies will inevitably overlap with the jurisdiction of traditional judicial courts.”); *see, e.g.*, *Pac. Lightnet, Inc. v. Time Warner Telecom, Inc.*, 318 P.3d 97, 109 (Haw. 2013) (“[P]rimary jurisdiction presumes that the claim at issue is originally cognizable by both the court and the agency.”).

⁴⁷³ Knippa, *supra* note 471, at 1291–92.

⁴⁷⁴ *United States v. W. Pac. R.R. Co.*, 352 U.S. 59, 63 (1956) (“‘Exhaustion’ applies where a claim is cognizable in the first instance by an administrative agency alone.”).

determination.⁴⁷⁵ Exhaustion is generally required where an agency is said to have “exclusive” jurisdiction over the claim.⁴⁷⁶

Application of these doctrines varies significantly among state jurisdictions.⁴⁷⁷ Drawing from a fifty-state survey conducted to inform this Article, we categorize states based on whether there is/are: 1) precedent providing direction on forum availability; 2) precedent providing guidance as to process and evaluation of forum availability; or 3) no rules that emerge from precedent.⁴⁷⁸

Importantly, the research demonstrates that categorization is fluid, and there is often space for courts to distinguish a claim to avoid precedent or apply an exception.⁴⁷⁹ This is likely to be particularly true with respect to climate resilience planning, which is a generally novel concern for courts and utility commissions.⁴⁸⁰ Thus, while this subpart categorizes states, the research should be viewed as illuminating the myriad ways in which questions regarding forum have been resolved in the past and could play out in future climate resilience claims.

⁴⁷⁵ Louis L. Jaffe, *Primary Jurisdiction*, 77 HARV. L. REV. 1037, 1037 (1964) (“Exhaustion emerges as a defense to judicial review of an administrative action not as yet deemed complete.”); *W. Pac. R.R. Co.*, 352 U.S. at 63 (when exhaustion applies, “judicial interference is withheld until the administrative process has run its course”).

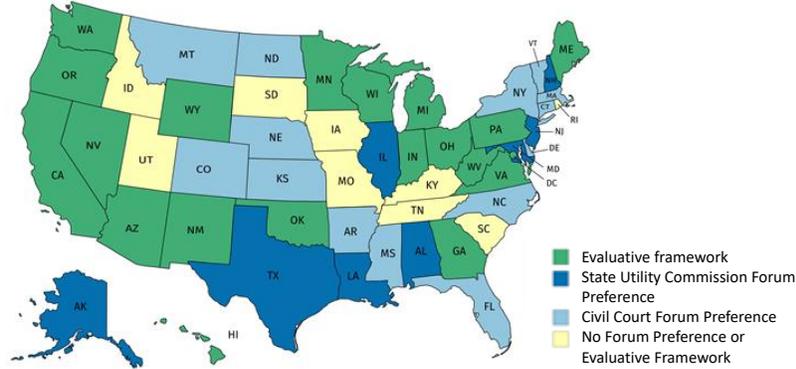
⁴⁷⁶ *See, e.g., Pac. Lightnet*, 318 P.3d at 109 (“[T]he court must first determine whether the agency has exclusive original jurisdiction, in which case, the doctrine of exhaustion would apply.”).

⁴⁷⁷ *See infra* Parts V.A1–3.

⁴⁷⁸ *See infra* Part V.A Box 12.

⁴⁷⁹ For example, even in states that ostensibly require claims against public utilities to be brought before the state public utility commission in the first instance, *see infra* Part V.A.1.b., courts have outlined some exceptions that might be invoked to allow a court to retain jurisdiction. *See, e.g., City of Graysville v. Glenn*, 46 So. 3d 925, 929 (Ala. 2010) (exception for purely legal claims); *Oncor Elec. Delivery Co. v. Chaparral Energy*, 546 S.W.3d 133 (Tex. 2018) (exception for situations where exhaustion would be futile or the remedy available is inadequate); *Daily Advertiser v. Trans-La, Div. of Atmos Energy Corp.*, 612 So. 2d 7 (La. 1993) (exception when there is a threat of irreparable injury).

⁴⁸⁰ *E.g., NORTH CAROLINA CLIMATE RISK ASSESSMENT AND RESILIENCE PLAN 2-1, 2-3* (2020) (providing North Carolina’s first resilience plan to address climate change); *see* discussion *supra* Part II.C.

Graphic 1: US Map with States Color Coded by Category**Box 12: Fifty State Survey – Description and Methodology**

This Part is informed by original research that identified relevant state-level precedent on primary jurisdiction and exhaustion. The research examined cases involving common law claims against electric and other public utilities. Specific emphasis was placed on cases involving tort claims brought against electric utilities. In some instances, we also examined cases involving other common law claims, primarily contract claims, to fill in research gaps where courts discussed forum for common law claims more generally. Likewise, claims against other types of utilities, particularly telecommunications and water utilities, were encompassed in the research.

Cases where a tort claim was brought against a utility and premised upon an extreme weather event were of particular note. Again, we believe these cases to be the best analogue for the climate resilience planning considerations that animate this Article. As such, this Part identifies and summarizes, when available, the analysis and holdings in those cases in particular.

1. Direction on Forum Availability

Twenty-two states have precedent that provides some consistency in whether tort law claims against an electric utility first proceed to a state court or the state utility commission.⁴⁸¹

⁴⁸¹ See *supra* Graphic 1: US Map with States Color Coded by Category (mapping the twenty-two states that have a forum preference for State Utility Commission or Civil Court forums when faced with common law claims against electric and other public utilities).

a. Civil Court

In fourteen states, precedent illustrates a pattern of allowing tort claims against an electric utility to be heard in a civil court in the first instance.⁴⁸² This is evidenced by either explicit statements that such claims fall within the province of the courts as a common law tort,⁴⁸³ or from a pattern of precedent in which courts heard such claims.⁴⁸⁴

One example is *Florida Power & Light v. Velez*,⁴⁸⁵ wherein a Florida appellate court was asked to address electricity customer allegations of gross negligence by Florida Power and Light (FPL) in the context of a

⁴⁸² These states include Arkansas, Colorado, Connecticut, Delaware, Florida, Kansas, Massachusetts, Mississippi, Montana, Nebraska, New York, North Carolina, North Dakota, and Vermont. *See id.*

⁴⁸³ *See, e.g.,* Paine, Webber, Jackson & Curtis, Inc. v. Adams, 718 P.2d 508, 513 (Colo. 1986) (“As courts of general jurisdiction, the district courts in Colorado have the authority to consider questions of law and of equity and to award legal and equitable remedies.”); Hamilton v. United Tel. Co. of Kas., 636 P.2d 202, 204 (Kan. Ct. App. 1981) (“[N]o administrative remedy exists for a party where the dispute is essentially private. Where there is no administrative remedy, the litigant may proceed directly to district court.”); Fernandes v. Attleboro Hous. Auth., 20 N.E.3d 229, 234 (Mass. 2014) (explaining that a court is not ousted of jurisdiction when a case presents at least one matter for judicial determination); State ex rel. Pub. Serv. Comm’n v. Dist. Court of First Jud. Dist., 84 P.2d 335, 335 (Mont. 1938) (concluding the state utility commission was not enacted for the purpose of “arbitrat[ing] controversies between utilities and private persons”); Green Mountain Power Corp. v. Sprint Commc’ns, 779 A.2d 687, 688 (Vt. 2001) (“[T]he Legislature did not intend to confer authority on the [Vermont Public Service] Board to decide issues of common law negligence.”).

⁴⁸⁴ *See, e.g.,* Entergy Miss., Inc. v. Acey, 153 So.3d 670, 671 (Miss. 2014) (reviewing an emotional distress claim of a mother who witnessed her daughter suffer burns from touching sagging power line); *see also, e.g.,* Williams v. Entergy Miss., Inc., 19 So.3d 757, 759 (Miss. Ct. App. 2008) (reviewing negligence claim by pedestrian who tripped on guy wire); Redhead v. Entergy Miss., Inc., 828 So.2d 801, 805 (Miss. Ct. App. 2001) (reviewing a negligence claim alleging the utility was responsible for a fire that resulted in damage to tree farm); Mitsubishi Elec. & Elecs. USA, Inc. v. Duke Power Co., 573 S.E.2d 742, 745 (N.C. Ct. App. 2002) (approving a trial court’s decision to try a tort claim in the first instance on the merits); Willis v. Duke Power Co., 229 S.E.2d 191, 193 (N.C. 1976) (reviewing claim alleging that negligent maintenance of wires caused a death by electrocution); Kirton v. Williams Elec. Coop., 265 N.W.2d 702, 703 (N.D. 1978) (reviewing a wrongful death claim based in negligence and nuisance); Dehn v. Otter Tail Power Co., 251 N.W.2d 404, 408 (N.D. 1977) (reviewing a negligence claim for personal injuries sustained from contact with transmission line); Froemke v. Otter Tail Power Co., 276 N.W. 146, 146 (N.D. 1937) (reviewing a negligence claim for property damage caused by fire); Del. Elec. Coop., Inc. v. Duphily, 703 A.2d 1202, 1205 (Del. 1997) (reviewing a negligence claim for personal injuries caused by electrocution); Delmarva Power & Light Co. v. Burrows, 435 A.2d 716, 717 (Del. 1981) (reviewing a negligence claim for personal injuries caused by electrocution); Scanlon v. Conn. Light & Power Co., 782 A.2d 87, 89 (Conn. 2001) (reviewing a claim that negligent maintenance and installation of equipment caused harm to dairy herd); Travelers Indem. Co. of Am. v. Conn. Light & Power Co., No. CV075012441S, 2008 WL 2447351, at *1 (Conn. 2008) (reviewing tort claims, including negligence and products liability, for home fire caused by voltage fluctuations).

⁴⁸⁵ Fla. Power & Light Co. v. Velez, 257 So.3d 1176, 1177 (Fla. Dist. Ct. App. 2018).

severe weather event.⁴⁸⁶ Plaintiffs asserted that FPL had failed to comply with storm-hardening standards imposed by the state utility commission.⁴⁸⁷ The court concluded the claims could be heard by the trial court, holding that “the mere fact that such claims may involve questions of whether FPL failed to meet certain standards established by the [state utility commission] does not divest the trial court of its jurisdiction, or vest exclusive jurisdiction in the [state utility commission], to resolve such issues.”⁴⁸⁸ The court relied on an earlier Florida Supreme Court decision that the court had jurisdiction over a claim against a telephone company for negligently failing to provide efficient telephone service as required by state utility commission standards.⁴⁸⁹ Florida courts widely cite that decision for the proposition that jurisdiction over tort claims properly lies with the judiciary even when the case concerns technical matters related to a utility’s regulatory compliance.⁴⁹⁰

b. State Utility Commission

Courts in eight states have precedent that indicates tort law claims are generally heard by the state utility commission in the first instance.⁴⁹¹

⁴⁸⁶ *Id.* at 1177. This class action lawsuit is ongoing and currently in the pre-trial discovery stage. See Civil, Family and Probate Courts Online System: Local Case No. 2017-022854-CA-01, MIAMI-DADE COUNTY CLERK OF THE CTS., <https://perma.cc/5CWH-BNPH> (last visited Mar. 11, 2021) (select the “Local Case Number” tab; search the case number “2017-022854-CA-01”) (showing status and docket history for Velez et al. v. Fla. Power & Light Co. et al.).

⁴⁸⁷ *Velez*, 257 So.3d at 1177.

⁴⁸⁸ *Id.*

⁴⁸⁹ *Id.* at 1177–78 (citing *S. Bell Tel. & Tel. Co. v. Mobile Am. Corp.*, 291 So.2d 199, 201–02 (Fla. 1974)).

⁴⁹⁰ See *Ramos v. Fla. Power & Light Co.*, 21 So.3d 91, 94 (Fla. Dist. Ct. App. 2009) (stating that exhaustion is not required in a suit against a utility for gross negligence related to meter tampering); see also *Trawick v. Fla. Power & Light Co.*, 700 So.2d 770, 771 (Fla. Dist. Ct. App. 1997) (reviewing an action for injunction and declaratory relief against a utility for improper tree trimming that was not within the public utility commission’s jurisdiction); *Fla. Power & Light Co. v. Glazer*, 671 So.2d 211, 214 (Fla. Dist. Ct. App. 1996) (stating that courts may hear tort claims where statutory and regulatory compliance is raised as a defense). New York courts have also allowed tort claims against utilities to proceed in civil court, including a claim in the context of an extreme weather event. See *Praetorian Ins. Co. v. Long Is. Power Auth.*, No. 704580/2014, 2019 N.Y. Misc. LEXIS 2952 at *2–4 (N.Y. Sup. Ct. Apr. 10, 2019) (claim against utility for failing to de-energize power lines ahead of Superstorm Sandy proceeds, with court deciding a motion to dismiss, but without reference to forum questions).

⁴⁹¹ These states include Alabama, Alaska, Illinois, Louisiana, Maryland, New Jersey, New Hampshire, and Texas. *E.g.*, *City of Graysville v. Glenn*, 46 So.3d 925, 931 (Ala. 2010); *Alaska Pub. Utils. Comm’n v. Chugach Elec. Ass’n*, 580 P.2d 687, 694 (Alaska 1978) (overruled on other grounds); *Adams v. N. Ill. Gas Co.*, 809 N.E.2d 1248, 1263 (Ill. 2004); *Richards v. Baton Rouge Water Co.*, 142 So.3d 1027, 1031–32 (La. Ct. App. 2014); *Bell Atl. of Md., Inc. v. Intercom Sys. Corp.*, 782 A.2d 791, 807 (Md. 2001); *Minutella v. Jersey Cent. Power & Light*, No. EC15060657 (N.J. Bd. of Pub. Utils. Aug. 19, 2015) (accepting primary jurisdiction over a case originally filed in a county court); *Nelson v. Pub. Serv. Co.*, 402 A.2d

In several of these states, the courts have reached this conclusion on the basis that the cases inevitably involve “services” or “rates” that are subject to state utility commission oversight, making it the primary adjudicator.⁴⁹² Others have concluded that adjudication of these claims requires the commission’s expertise in resolving questions of fact.⁴⁹³ Notably, these courts have reached this conclusion even in light of state case law holding that typical common law claims, like tort and contract claims, can be heard by the trial court initially.⁴⁹⁴ Often, tort claims against utilities in these states will be bifurcated, such that all issues within the jurisdiction of the state utility commission will be decided in that forum first and then questions of negligence will be decided by the judiciary.⁴⁹⁵

Illinois is particularly illustrative. The Illinois Commerce Commission has exclusive jurisdiction over claims stemming from services and rates of public utilities under its jurisdiction.⁴⁹⁶ The Illinois Supreme Court most recently considered this authority in *Sheffler v. Commonwealth Edison Co.*⁴⁹⁷ and interpreted it broadly. Plaintiff customers had lost power during a winter storm, and alleged that electric utility Commonwealth Edison (ComEd) had negligently failed to provide adequate, efficient, and reliable electrical service in violation of its statutory duties.⁴⁹⁸ The Illinois Supreme Court affirmed the lower court’s holding that such claims went to the service provided for the rates charged and should be heard by the commission, not the court.⁴⁹⁹ The high

623, 625 (N.H. 1979); *Oncor Elec. Delivery Co. v. Chaparral Energy*, 546 S.W.3d 133, 139–40 (Tex. 2018).

⁴⁹² *E.g.*, *Richards*, 142 So.3d at 1031–32; *Oncor Elec. Delivery Co.*, 546 S.W.3d at 139–40.

⁴⁹³ *E.g.*, *Alaska Pub. Utils. Comm’n*, 580 P.2d at 694; *Bell Atl. of Md., Inc.*, 782 A.2d at 807.

⁴⁹⁴ *E.g.*, *Nelson*, 402 A.2d at 625; *City of Graysville*, 46 So.3d at 931.

⁴⁹⁵ *See infra* Part V.A.2; *see also, e.g.*, *Minutella v. Jersey Cent. Power & Light*, No. EC15060657, 11, 15 (N.J. Bd. of Pub. Utils. Oct. 20, 2017) (order adopting initial decision in part and modifying initial decision in part). Defendants argued the negligence claim raised issues regarding the “safe, adequate and proper provision” of service, which were issues “within the exclusive authority and expertise of the BPU.” *Id.* at 17. The court agreed. While the question of negligence was within the “conventional experience and jurisdiction of the courts,” the “issues of safe delivery” of electricity service fell within the jurisdiction of the BPU, which should be allowed to decide “factual issues as to whether it was appropriate or necessary to suspend the delivery of electrical service” in the first instance. *Id.* at 32–33.

⁴⁹⁶ *E.g.*, *Adams*, 809 N.E.2d at 1263; *Vill. of Roselle v. Commonwealth Edison Co.*, 859 N.E.2d 1, 8 (Ill. App. Ct. 2006); *City of Chicago ex rel. Thrasher v. Commonwealth Edison Co.*, 513 N.E.2d 460, 462 (Ill. App. Ct. 1987). *But cf.* *Sutherland v. Ill. Bell*, 627 N.E.2d 145, 152 (Ill. App. Ct. 1993) (finding the claims that the services and equipment of phone company were unordered, inadequate or ambiguously billed constituted typical claims for damages and within the province of the courts).

⁴⁹⁷ *Sheffler v. Commonwealth Edison Co.*, 923 N.E.2d 1259, 1262 (Ill. App. Ct. 2010), *aff’d*, 955 N.E.2d 1110, 1122 (Ill. 2011).

⁴⁹⁸ *Id.* at 1262.

⁴⁹⁹ *Sheffler*, 955 N.E.2d at 1122. The lower court found that the plaintiffs claim was for “reparations,” as opposed to civil damages, because “the essence of the claim is that a utility has charged too much for a service.” *Sheffler*, 923 N.E.2d at 1275. The complaint pertained

court found the nature of the relief sought “was predicated on allegations that ComEd was not providing adequate service,” which “goes directly to ComEd’s service and infrastructure, which is within the Commission’s original jurisdiction.”⁵⁰⁰ It also explained it was “essential” that the agency handle matters related to service and rates that involved technical data and expert opinions.⁵⁰¹ Illinois is therefore an example of a jurisdiction that has concluded that claims against a utility, even those that sound in tort, must be heard first by the state utility commission.

2. Evaluative Framework for Assessing Forum Availability

Courts in nineteen states and the District of Columbia have adopted evaluative frameworks to determine proper forum for particular tort law claims brought against an electric utility.⁵⁰² Courts in these states have identified relevant considerations that judges should weigh in assessing primary jurisdiction. While not all states use each, five common considerations are: 1) the relative expertise of each potential adjudicator; 2) the desire for regulatory uniformity; 3) the potential for adjudication to interfere with the agency’s role; 4) whether the claim is of public concern; and 5) the possible futility of agency adjudication.⁵⁰³ These considerations are not specific to cases involving electric utilities. However, given the expansive jurisdiction of state utility commissions over electric utilities, the considerations are particularly useful in applying primary jurisdiction doctrine in such cases.

First, courts often consider the relative expertise of each potential adjudicator. Where tort law issues “predominate”⁵⁰⁴ or only issues of

to rates because it “concerns claims that ComEd provided inadequate or unreliable electric services.” *Id.*

⁵⁰⁰ *Sheffler*, 955 N.E.2d at 1124–25.

⁵⁰¹ *Id.* at 1122.

⁵⁰² These states include Arizona, California, Georgia, Hawaii, Indiana, Maine, Michigan, Minnesota, Nevada, New Mexico, Ohio, Oklahoma, Oregon, Pennsylvania, Virginia, Washington, West Virginia, Wisconsin, and Wyoming. Notably, Oklahoma, Virginia and Wyoming do not use a multifactor test, but instead the answer seems to hinge primarily on whether the case involves public or private rights. *See infra* note 524 and accompanying text.

⁵⁰³ As discussed above, CLF’s statutory failure to adapt lawsuit against ExxonMobil has been stayed under federal primary jurisdiction doctrine. *See supra* note 392 and accompanying text. The district court there considered some similar factors in assessing whether to stay its proceedings to allow EPA an opportunity to review the permit at issue first. *CLF v. Shell Memorandum & Order*, *supra* note 392, at *14. The court relied on the *Blackstone* factors: “(a) ‘the agency determination [i]s] at the heart of the task assigned the agency by Congress’; (b) ‘agency expertise [i]s] required to unravel intricate, technical facts’; (c) ‘the agency determination would materially aid the court’; and (d) deference to the agency would ‘serve the interest of national uniformity in regulation.’” *Id.* (quoting *Massachusetts v. Blackstone Valley Elec. Co.*, 67 F.3d 981, 992 (1st Cir. 1995)).

⁵⁰⁴ *E.g.*, *Campbell v. Mountain States Tel. & Tel. Co.*, 586 P.2d 987, 993 (Ariz. Ct. App. 1978); *Nev. Power Co. v. Eighth Jud. Dist. Ct.*, 102 P.3d 578, 588 (Nev. 2004). Indiana has ruled that if even one issue falls within the court’s subject matter jurisdiction, the whole

statutory interpretation or legal construction are raised,⁵⁰⁵ claims are viewed as falling within the “conventional” jurisdiction of the judiciary.⁵⁰⁶ Courts may presume they have at least as much expertise in handling these claims, if not more.⁵⁰⁷ However, state utility commissions may be better qualified to examine technical questions that arise in claims against electric utilities and to make conclusions about compliance with the statutory and regulatory scheme.⁵⁰⁸ State utility commissions are viewed as having “special competence”⁵⁰⁹ and expertise in these areas.⁵¹⁰

Second, courts also consider regulatory uniformity. Where court adjudication could create inconsistency through ad hoc judicial decisions applying regulations and resolving similar issues, courts may decide that claims are best heard in the first instance by the state utility commission.⁵¹¹ Likewise, a court might consider whether judicial adjudication could lead to conflicting decisions not just between judges, but also between the courts and the state utility commission.⁵¹²

Third, and relatedly, courts also consider whether adjudication would interfere with the legislative purpose in creating regulatory agencies. Courts are often reticent to interfere in areas that have been delegated to agencies and seek to respect the role that the legislatures intended for agencies to fill.⁵¹³ The courts, therefore, will often refer claims to regulatory agencies where there are relevant regulatory

case falls within its jurisdiction. *Austin Lakes Joint Venture v. Avon Utils.*, 648 N.E.2d 641, 646 (Ind. 1995).

⁵⁰⁵ See e.g., *MDC Rests., LLC v. Eighth Judicial Dist. Ct.*, 419 P.3d 148, 153 (Nev. 2018) (refusing to refer a question of constitutional interpretation to the agency); *State ex rel. Norvell v. Ariz. Pub. Serv. Co.*, 510 P.2d 98, 104 (N.M. 1973) (“[I]f statutory interpretation or issues of law are significant, the court may properly choose in its discretion to entertain the proceedings.”).

⁵⁰⁶ E.g., *Campbell*, 586 P.2d at 991; *State ex rel. Bell Atlantic-West Virginia v. Ranson*, 497 S.E.2d 755, 764 (W. Va. 1997). Some states refer to these types of case as “inherently judicial.” E.g., *City of Rochester v. People’s Coop. Power Ass’n*, 483 N.W.2d 477, 480 (Minn. 1992).

⁵⁰⁷ E.g., *Campbell*, 586 P.2d at 991; *District of Columbia v. D.C. Pub. Serv. Comm’n*, 963 A.2d 1144, 1153 (D.C. 2009) (explaining that the doctrine of primary jurisdiction informs the court of whether to exercise jurisdiction rather than negating the court’s jurisdiction); *Am. Ass’n of Cruise Passengers v. Cunard Line*, 31 F.3d 1184, 1186 (D.C. 1994); *Benton Falls Assocs. v. Cent. Me. Power Co.*, 828 A.2d 759, 764 (Me. 2003).

⁵⁰⁸ E.g., *Elkin v. Bell Tel. Co.*, 420 A.2d 371, 376 (Pa. 1980); *MDC Rests.*, 419 P.3d at 153; e.g., *Norvell*, 510 P.2d at 103–04; *State ex rel. Chesapeake & Potomac Tel. Co. v. Ashworth*, 438 S.E.2d 890, 894 (W. Va. 1993).

⁵⁰⁹ E.g., *District of Columbia*, 963 A.2d at 1153; *Austin Lakes*, 648 N.E.2d at 647.

⁵¹⁰ E.g., *Durcon Co. v. Detroit Edison Co.*, 655 N.W.2d 304, 311 (Mich. Ct. App. 2002); *District of Columbia*, 963 A.2d at 1152.

⁵¹¹ E.g., *Elkin*, 420 A.2d at 376; *City of Taylor v. Detroit Edison Co.*, 715 N.W.2d 28, 35 (Mich. 2006); *Bell Atlantic-West Virginia*, 497 S.E.2d at 764.

⁵¹² E.g., *Dreyer v. Portland Gen. Elec. Co.*, 142 P.3d 1010, 1022 (Or. 2006); *Bell Atlantic-West Virginia*, 497 S.E.2d at 764.

⁵¹³ E.g., *Farmers Ins. Exch. v. Superior Ct.*, 826 P.2d 730, 741 (Cal. 1992); *Kona Old Hawaiian Trails Grp. v. Lyman*, 734 P.2d 161, 168–69 (Haw. 1987); *Matthews v. District of Columbia*, 875 A.2d 650, 655 (D.C. 2005); see also, e.g., *City of Taylor*, 715 N.W.2d at 35–36 (Mich. 2006) (asking whether “the court would upset the regulatory scheme of the agency”).

standards in place,⁵¹⁴ where interpretation of technical terms or tariff provisions is needed,⁵¹⁵ or where a claim involves “a general supervisory or regulatory policy.”⁵¹⁶

Fourth, courts consider whether the claim is a matter of public concern or of a private nature. Where tort claims against electric utilities implicate “broad public doctrines”⁵¹⁷ or “widespread acts,”⁵¹⁸ and involve disputes affecting the public⁵¹⁹ that are not unique to one party,⁵²⁰ such claims are best heard by the agency. However, where claims are purely private disputes⁵²¹ or relate to personal injury or property damage not covered by tariffs,⁵²² the court might choose to retain the case because regulatory schemes are not designed to address such individual harm. Courts also refer to this consideration as a division between “individual rights and public rights.”⁵²³ Some courts most heavily rely on this consideration to the exclusion of others, although the dividing line between public and private rights claims remains hazy.⁵²⁴

Fifth, courts consider the futility or inadequacy of agency processes due to a lack of remedy. Often, this becomes particularly important where

⁵¹⁴ *Corrigan v. Illuminating Co.*, 910 N.E.2d 1009, 1011–14 (Ohio 2009); *see San Diego Gas & Elec. Co. v. Superior Ct.*, 920 P.2d 669, 687–88 (Cal. 1996) (asking whether the CPUC is actually exercising authority to regulate the matter at issue in assessing whether a claim belongs before the CPUC); *Ind. Mich. Power Co. v. Runge*, 717 N.E.2d 216, 225 (Ind. Ct. App. 1999) (discussing how courts should refer particular issues to the expert agency while retaining ultimate jurisdiction over the case).

⁵¹⁵ *E.g.*, *Bell Atlantic-West Virginia*, 497 S.E.2d at 764; *Levesque v. Cent. Me. Power Co.*, 2019 Me. Bus. & Consumer LEXIS at *5–9 (Me. Bus. & Cons. Ct. 2019).

⁵¹⁶ *Wilson v. S. Cal. Edison*, 184 Cal. Rptr. 3d 26, 45–46 (Cal. Ct. App. 2015).

⁵¹⁷ *Campbell v. Mountain States Tel. & Tel. Co.*, 586 P.2d 987, 993 (Ariz. Ct. App. 1978).

⁵¹⁸ *D.J. Hopkins, Inc. v. GTE Northwest, Inc.*, 947 P.2d 1220, 1225 (Wash. Ct. App. 1997) (“Courts often defer to agency jurisdiction when the allegations involve widespread acts” rather than “an isolated action or transaction.”).

⁵¹⁹ *Sw. Pub. Serv. Co. v. Artesia Alfalfa Growers’ Ass’n*, 353 P.2d 62, 68–69 (N.M. 1960); *accord OS Farms, Inc. v. N.M. Am. Water Co.*, 218 P.3d 1269, 1277 (N.M. Ct. App. 2009) (“[W]hen there is a clear demarcation between acts concerning rights of private litigants and acts affecting the public interest” the courts have jurisdiction over the former and the PUC over the latter) (quiet title suit against utility and commission).

⁵²⁰ *E.g.*, *D.J. Hopkins*, 947 P.2d at 1225 (citing *Moore v. Pac. Nw. Bell*, 662 P.2d 398, 402 (Wash. Ct. App. 1983), approving of a “distinction between tortious injury unique to one and unreasonable practices suffered by all”).

⁵²¹ *E.g.*, *Campbell*, 586 P.2d at 993; *Artesia Alfalfa Growers’*, 353 P.2d at 68–69; *D.J. Hopkins*, 947 P.2d at 1225.

⁵²² *E.g.*, *Rinaldo’s Constr. Corp. v. Mich. Bell Tel. Co.*, 559 N.W.2d 647, 654 (Mich. 1997).

⁵²³ *Artesia Alfalfa Growers’*, 353 P.2d at 68 (noting prior case finding the right to not be discriminated against is an individual right, while the public has a right to be protected against exorbitant rates and explaining that the former is a “legal right,” while the latter is a “political right”).

⁵²⁴ For example, Oklahoma courts have emphasized that the state utility commission has jurisdiction over public rights claims, described as those that “arise ‘between the government and others,’” *Tenneco Oil Co. v. El Paso Nat. Gas Co.*, 687 P.2d 1049, 1053 (Okla. 1984) (quoting *N. Pipeline Co. v. Marathon Pipeline*, 458 U.S. 50, 69 (1982)), and Wyoming courts have concluded the state utility commission’s jurisdiction extends to “matters ‘affected with a public interest,’” which are services geared “to or for the public.” *In re Investigation of Mountain States Tel. & Tel. Co.*, 745 P.2d 563, 569–70 (Wyo. 1987).

a state utility commission is unable to award monetary damages that the plaintiff seeks.⁵²⁵ Courts will also emphasize adjudicatory efficiency and acknowledge the burden that an exhaustion requirement would place on a plaintiff in assessing whether futility favors court adjudication.⁵²⁶

3. No Rules Emerge from Precedent

In the remaining nine states, precedent is limited and uneven on forum availability and evaluative framework.⁵²⁷ In some states, there is insufficient case law addressing proper forum or involving tort claims against utilities.⁵²⁸ In other states, courts have not clearly distinguished a tort law claim from an adequacy of service claim.⁵²⁹ In Missouri, there is conflicting case law on the issue—early decisions provided guidance, but those cases appear to have been contradicted in later decisions without explanation.⁵³⁰

⁵²⁵ *E.g.*, *Moore*, 662 P.2d at 400–01; *Siewart v. N. States Power Co.*, 793 N.W.2d 272, 285–86 (Minn. 2011).

⁵²⁶ *E.g.*, *Elkin v. Bell Tel. Co.*, 420 A.2d 371, 375 (Pa. 1980); *Pac. Lightnet, Inc. v. Time Warner Telecom, Inc.*, 318 P.3d 97, 109, 118 (Haw. 2013).

⁵²⁷ These states include Idaho, Iowa, Kentucky, Missouri, Rhode Island, South Carolina, South Dakota, Tennessee, and Utah.

⁵²⁸ For example, in Iowa, there have been stray-voltage negligence and nuisance claims that have proceeded before state trial courts. *E.g.*, *Teleconnect Co. v. U.S. West Commc'ns*, 508 N.W.2d 644, 649–50 (Iowa 1993). However, these cases have proceeded without any discussion of the proper forum and whether the Iowa Utilities Board should hear the claim first. *E.g.*, *Dalarna Farms v. Access Energy Coop.*, 792 N.W.2d 656 (Iowa 2010); *Martins v. Interstate Power Co.*, 652 N.W.2d 657 (2002); *Umbdenstock v. Interstate Power Co.*, No. 07-1816, 2008 WL 3367600 (Iowa Ct. App. Aug. 13, 2008); *Iowa Lakes Elec. Coop. v. Schmitt*, No. 98-0581, 2001 WL 355722 (Iowa Ct. App. Apr. 11, 2001); *Fox v. Interstate Power Co.*, 521 N.W.2d 762 (Iowa Ct. App. 1994). Furthermore, given the lack of non-stray voltage claims to provide greater analysis regarding forum, the question of where a tort claim against a utility should be first heard remains open.

⁵²⁹ For example, in Kentucky, some tort claims against a utility can be heard in court if a plaintiff can successfully argue the threshold question that distinguishes her claims from “service” or “rates” cases. Kentucky courts have seemingly defined service broadly enough to encompass any claim related to the quantity or quality of service. *Benzinger v. Union Light, Heat & Power Co.*, 170 S.W.2d 38 (Ky. 1943). Nevertheless, case law also suggests that the PSC does not have any jurisdiction over a claim that is a “purely private concern” between a utility and a customer. *See Louisville Gas & Electric Co. v. Dulworth*, 130 S.W.2d 753 (Ky. 1939). However, most of the cases that concern primary or exclusive jurisdiction are old and have not been revisited in some time. It is not clear how a Kentucky court would deal with a claim that appeared to be a “purely private concern” but involved quality of service.

⁵³⁰ While a more recent case established a three-factor test for primary jurisdiction, *see Killian v. J & J Installers, Inc.*, 802 S.W.2d 158, 160 (Mo. 1991) (en banc), a much older case continues to be cited as the seminal primary jurisdiction decision and that three-factor test has been ignored. *State ex rel. and to Use of Kan. City Power & Light Co. v. Buzard*, 168 S.W.2d 1044, 1048 (Mo. 1943) (en banc), *cited by, e.g.*, *Inter-City Beverage Co., Inc. v. Kan. City Power & Light Co.*, 889 S.W.2d 875, 877 (Mo. Ct. App. 1994). What’s more, a variety of tort suits against utilities have simply proceeded in court without discussion of either case. *See generally, e.g.*, *Gladden v. Mo. Pub. Serv. Co.*, 277 S.W.2d 510 (Mo. 1955) (negligence case proceeding without discussion); *Sparks v. Platte-Clay Elec. Coop.*, 861 S.W.2d 604 (Mo. Ct. App. 1993) (electrical fire negligence proceeds without discussion). In addition, some

B. State Utility Commission Findings in “Collateral” Case

Where the state utility commission makes findings and conclusions in the first instance, plaintiffs might choose to bring (or reinstitute) “collateral” civil litigation against an electric utility before the state trial court. This may occur where the state utility commission was unable to provide the requested remedy or where the state court bifurcated the proceeding between regulatory compliance, highly technical issues, or both on the one hand and tort law questions on the other. A few state courts have provided direction on the effect of state utility commission proceedings on subsequent civil litigation against electric utilities. In most cases, the courts have held that statutory and regulatory compliance findings of the state utility commission will not be binding on questions of law, but the court will take the commission’s factual findings and apply them in making legal conclusions.⁵³¹ Some courts have been clear that compliance findings are subject to collateral estoppel,⁵³² while others have allowed for some review.⁵³³

This subpart is intended to demonstrate how related state utility commission and state court proceedings may interact. As discussed above, there are instances where some aspects of a case should be decided by the expert agency, while other matters must be determined by the competent legal court. We highlight cases from four states—Florida, Texas, Pennsylvania, and Massachusetts—that illustrate different ways courts have considered the effect of state utility commission determinations and findings on collateral civil litigation.

1. Florida

In Florida, the state utility commission’s findings, like those regarding statutory or regulatory compliance, are not binding on questions of tort liability in collateral civil litigation. For example, in *Southern Bell Telephone & Telephone Co. v. Mobile America Corp.*, the plaintiff alleged its telephone utility failed to comply with its statutory duty to provide efficient phone service and sought monetary damages.⁵³⁴ The Florida Supreme Court concluded that where a trial court seeks the expertise of the state utility commission regarding statutory compliance,

cases have simply said that the PSC cannot abrogate tort law claims for negligence. *E.g.*, *Pub. Serv. Comm’n v. Mo. Gas Energy*, 388 S.W.3d 221, 231 (Mo. Ct. App. 2012).

⁵³¹ *E.g.*, *S. Bell Tel. & Tel. Co. v. Mobile Am. Corp.*, 291 So.2d 199, 201–02 (Fla. 1974).

⁵³² *E.g.*, *Elkin*, 420 A.2d at 376–77. The doctrine of collateral estoppel applies to “preclude[] relitigation of issues actually litigated and necessary to the outcome of the first action” in a second action where a judgment has been rendered in a prior case. *Parkland Hosiery Co. v. Shore*, 439 U.S. 322, 326 n.5 (1979). Offensive “collateral estoppel occurs when the plaintiff seeks to foreclose the defendant from litigating an issue the defendant has previously litigated unsuccessfully.” *Id.* at 326 n.4. Defensive collateral estoppel “occurs when a defendant seeks to prevent a plaintiff from asserting a claim the plaintiff has previously litigated.” *Id.*

⁵³³ *E.g.*, *Oncor Elec. Delivery Co. v. Chaparral Energy*, 546 S.W.3d 133, 142 (Tex. 2018).

⁵³⁴ *S. Bell Tel. & Tel. Co.*, 291 So.2d at 201.

its findings “are not conclusive but should be considered together with any other evidence before the court on the issue of liability, and on the issue of damages if applicable to that issue.”⁵³⁵ Decisions should be made by considering the “total evidence”; state utility commission findings are “much like that of the report of a referee or special master which the court, or jury, could act upon as all of the evidence might indicate.”⁵³⁶

2. Texas

The U.S. Supreme Court held that factual findings made by the state utility commission should be reviewed under the “substantial evidence” standard—that is, “such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.”⁵³⁷ In *Oncor Electric Delivery Co. v. Chaparral Energy*, the plaintiff brought a breach of contract claim in Texas District Court against the electric utility for failing to adhere to the service agreement.⁵³⁸ The electric utility contended that the state utility commission had jurisdiction and should hear the claim first; the court agreed.⁵³⁹ The Texas Supreme Court explained that there was a two-step hybrid process for resolution of common law claims against utilities for monetary damages.⁵⁴⁰ First, because a relevant statutory scheme required an agency with exclusive jurisdiction to make certain findings before a trial court could adjudicate a claim, the agency needed to first resolve all issues that fell within its exclusive jurisdiction.⁵⁴¹ Second, those findings could then be used in a later filed suit before a trial court to obtain any relief that the agency was unable to provide.⁵⁴² Commission findings relied upon in the later-filed suit would be “subject to substantial-evidence review.”⁵⁴³

3. Pennsylvania

The Pennsylvania Supreme Court, in *Elkin v. Bell Telephone Co. of Pennsylvania*, stated that state utility commission determinations regarding statutory and regulatory compliance are “binding upon the court and the parties... and [are] not subject to collateral attack in the pending court proceeding.”⁵⁴⁴ There, among other claims, the plaintiff alleged that the telephone company had negligently failed to provide

⁵³⁵ *Id.* at 201–02.

⁵³⁶ *Id.* at 202.

⁵³⁷ *Richardson v. Perales*, 402 U.S. 389, 401 (1971) (quoting *Consolidated Edison Co. v. National Labor Relations Board*, 305 U.S. 197, 229 (1938)).

⁵³⁸ 546 S.W.3d at 137.

⁵³⁹ *Id.* at 138–41.

⁵⁴⁰ *Id.* at 142.

⁵⁴¹ *Id.*

⁵⁴² *Id.*

⁵⁴³ *Id.* (quoting *Subaru of Am., Inc. v. David McDavid Nissan Inc.*, 84 S.W.3d 217, 224 (Tex. 2002)).

⁵⁴⁴ *Elkin v. Bell Tel. Co.*, 420 A.2d 371, 376 (Pa. 1980).

reasonable service.⁵⁴⁵ The company contended the state utility commission had jurisdiction over the issues, and the trial court agreed and stayed the case until the commission made determinations on standards of service.⁵⁴⁶ In affirming the lower court's decision, the Pennsylvania Supreme Court explained that where a matter is referred by the trial court to the state utility commission, it cannot allow the commission's determinations to be challenged in the collateral trial court case—they are subject to appellate review, but not collateral attack.⁵⁴⁷ The collateral case, “will not, of course, be used to relitigate the question of adequacy of services, but only to litigate such questions as were not resolved through administrative channels.”⁵⁴⁸ The civil litigation will be “guided in scope and direction by the nature and outcome of the agency determination.”⁵⁴⁹

4. Massachusetts

The Massachusetts Supreme Court has opined on whether a trial court may apply offensive collateral estoppel to state utility commission factual findings. In *Bellermann v. Fitchburg Gas & Electric Light Co.*,⁵⁵⁰ the state utility commission *sua sponte* opened an investigation into a utility's preparation and response to a major winter storm to determine whether it had satisfied its public service obligation to provide safe and reliable service.⁵⁵¹ After an investigation and adjudicatory proceedings, the state utility commission concluded that the electric utility had violated its obligations.⁵⁵² Electric utility customers subsequently filed a class action lawsuit alleging gross negligence and statutory violations and requested the court grant the commission's findings issue preclusive effect.⁵⁵³ Unlike the Pennsylvania Supreme Court in *Elkin*, which made a blanket statement on the application of collateral estoppel to state utility commission factual findings, the Massachusetts Supreme Court in *Bellermann* explained that the trial court has broad discretion in determining whether offensive collateral estoppel should apply.⁵⁵⁴ The court emphasized that the central inquiry is whether the defendant had

⁵⁴⁵ *Id.* at 373.

⁵⁴⁶ *Id.* Pennsylvania, like Texas, employs a bifurcated jurisdictional procedure in which trial courts may, under the doctrine of primary jurisdiction, refer aspects of a claim to the commission where adjudication of the matter involves statutory or regulatory compliance or standards of service that fall within the state utility commission's jurisdiction and technical expertise. *Id.* at 374–75.

⁵⁴⁷ *Id.* at 376–77.

⁵⁴⁸ *Id.* at 376–77 n.7 (quoting *Feingold v. Bell of Pa.*, 383 A.2d 791, 801 n.5 (Pa. 1977)).

⁵⁴⁹ *Id.* at 377.

⁵⁵⁰ 18 N.E.3d 1050 (Mass. 2014).

⁵⁵¹ *Id.* at 1057.

⁵⁵² *Id.* at 1057–58.

⁵⁵³ *Id.* at 1054. While the plaintiffs sought to apply issue preclusion, the court uses the term collateral estoppel instead, explaining they are the same concept. *Id.* at 1065.

⁵⁵⁴ *Id.* at 1065–66, 1068–69.

a full and fair opportunity to litigate in the first action.⁵⁵⁵ In concluding that the lower court had not abused its discretion in finding that the state utility commission's findings had preclusive effect, the court highlighted the robust procedural nature of the commission proceeding at issue: "The [commission] conducted a five-day adjudicatory hearing at which [Fitchburg Gas & Electric] (FG & E) was represented by competent counsel, and FG & E had a right to proffer evidence, subpoena witnesses, cross-examine witnesses under oath, present oral and written arguments, and appeal an adverse decision."⁵⁵⁶

C. Limitations on Liability

State utility commission-approved tariffs often limit the liability of electric utilities in a variety of ways.⁵⁵⁷ Tariff provisions vary significantly in language and scope, not just by state, but also between utilities operating within the same jurisdiction.⁵⁵⁸ These limitations can bind the hands of judges in providing relief to parties injured by electric utilities' actions (or failure to act). Limitations on liability have generally been justified as in the public interest on the basis that, when their liability is defined and limited, electric utilities are better able to provide service at reasonable rates.⁵⁵⁹ Such limitations will be binding on state courts: tariffs have the force and effect of law.⁵⁶⁰ Limitation provisions are generally enforced under the filed rate doctrine, which prevents courts from hearing collateral challenges to approved tariff provisions.⁵⁶¹ However, the courts in a few states have concluded that certain liability provisions are unenforceable as contrary to public policy. Further, while these liability provisions could severely limit judges' ability to provide relief, courts have retained flexibility through their ability to interpret

⁵⁵⁵ *Id.* at 1065.

⁵⁵⁶ *Id.* at 1069.

⁵⁵⁷ In some states, statutes and regulations also may limit liability. *See, e.g.*, UTAH CODE ANN. § 54-22-203 (2018) (electric utility cannot be held liable for damage to cattle from stray voltage); S.D. CODIFIED LAWS § 49-47-7 (2015) (stray voltage damages limited to those incurred in the year prior to notice to utility). In other states, statutes or regulations may prevent limitations on liability. *See, e.g.*, VA. CODE ANN. § 56-260 (2021) (prohibiting utility from including provisions limiting liability for personal injury or property damage related to power lines); N.Y. COMP. CODES R. & REGS. tit. 16, § 218.1 (2021) (prohibiting inclusion of certain limitations of liability in utility tariffs).

⁵⁵⁸ *Re Liability of Elec. Power Cos. for Injury or Damages Resulting from Problems in Delivery of Elec. Power*, 82 Md. P.S.C. 92 (Md. Pub. Serv. Comm'n Apr. 5, 1991) (noting lack of uniformity in liability provisions among utilities operating in the state and rejecting proposal to standardize the liability provision).

⁵⁵⁹ *E.g.*, *W. Union Tel. Co. v. Esteve Bros. & Co.*, 256 U.S. 566, 569 (1921); *Comput. Tool & Eng'g, Inc. v. N. States Power Co.*, 453 N.W.2d 569, 572 (Minn. Ct. App. 1990); *U.S. Airways, Inc. v. Qwest Corp.*, 361 P.3d 942, 946 (Ariz. Ct. App. 2015), *aff'd in relevant part*, (2016).

⁵⁶⁰ *E.g.*, *Pac. Lightnet, Inc. v. Time Warner Telecom, Inc.*, 318 P.3d 97, 110 (Haw. 2013); *State Farm Fire & Cas. Co. v. PECO*, 54 A.3d 921, 926 (Pa. 2012); *Adams v. N. Ill. Gas Co.*, 809 N.E.2d 1248, 1263 (Ill. 2004).

⁵⁶¹ *E.g.*, *Teleconnect Co. v. U.S. W. Commc'ns*, 508 N.W.2d 644, 648 (Iowa 1993).

and apply tariff language. In some states, courts have narrowly construed tariff provisions to limit their application.⁵⁶²

While there are some differences between states, only a few courts have refused completely to enforce tariff limitations on liability.⁵⁶³ In a majority of states, courts have held that tariff provisions may limit an electric utility's liability for ordinary negligence that causes economic harm, but may not limit liability for gross negligence or willful or wanton misconduct causing economic harm.⁵⁶⁴ A few have extended this rule to allow utilities to limit their liability for ordinary negligence that causes personal injury or property damage.⁵⁶⁵ There are also states that have allowed electric utilities to limit liability for gross negligence causing economic harm.⁵⁶⁶

Beyond broad limitations on ordinary negligence, electric utilities' tariffs often limit claims in more specific ways. For example, rather than

⁵⁶² See *infra* notes 582–587 and accompanying text.

⁵⁶³ See, e.g., *Mobile Elec. Serv., Inc. v. FirsTel, Inc.*, 649 N.W.2d 603, 606–07 (S.D. 2002) (inclusion of limitations on liability creates contracts of adhesion because customers have no choice but to accept the tariff terms); *Discount Fabric of Racine, Inc. v. Wis. Tel. Co.*, 345 N.W.2d 417, 426 (Wis. 1984). Michigan courts have conflicting case law, although *Allen v. Michigan Bell Telephone Co.* is often relied upon by other jurisdictions as a decision concluding tariff limitations should not be enforced. 171 N.W.2d 689, 694 (Mich. Ct. App. 1969). *But see* *Durcon Co. v. Detroit Edison Co.*, 655 N.W.2d 304, 311 (Mich. Ct. App. 2002) (applying *Rinaldo's Constr. Corp., v. Mich. Bell Tel. Co.*, 559 N.W.2d 647, 654 (Mich. 1997), concluding that tariff limitations on liability are presumptively valid until challenged before the commission). *Adams v. Northern Illinois Gas Co.*, is another case often relied upon for the same premise. 809 N.E.2d 1248, 1273. Later Illinois case law, however, is clear that tariff limitations on liability that speak to the issue are controlling. See, e.g., *Sheffler v. Commonwealth Edison Co.*, 955 N.E.2d 1110, 1121 (Ill. 2011). Most recently, a Connecticut trial court generally questioned whether the state utility commission had any authority to approve limitations on liability provisions, and specifically questioned the validity of its broad exculpatory clause that could be read to “immunize CL&P from any liability whatsoever.” *O'Neill v. Conn. Light & Power Co.*, No. HHDCV186089044S, 2020 WL 1889124, at *7 (Conn. Super. Ct. Feb. 21, 2020). *But see* *Zurich Am. Ins. Co. v. S. Conn. Gas Co.*, 442 F. Supp. 3d 510, 519 (D. Conn. 2020) (enforcing gas company's limitation on liability for negligence provision).

⁵⁶⁴ E.g., *Danisco Ingredients USA, Inc. v. Kan. City Power & Lighting Co.*, 986 P.2d 377, 384–85 (Kan. 1999) (noting that “Kansas [has] follow[ed] the majority rule”); *Bullman, Inc. v. Nev. Bell*, 825 P.2d 588, 592–93 (Nev. 1992) (affirming lower court's endorsement of “a majority of neighboring jurisdictions”).

⁵⁶⁵ E.g., *Sw. Elec. Power Co. v. Grant*, 73 S.W.3d 211, 220 (Tex. 2002) (allowing limitation on liability for personal injury where it is narrowly drawn); *Los Angeles Cellular Tel. Co. v. Superior Ct. of L.A. Cnty.*, 76 Cal. Rptr.2d 894 (Cal. Ct. App. 1998) (same); *Landrum v. Fla. Power & Light Co.*, 505 So.2d 552, 554 (Fla. Dist. Ct. App. 1987) (same). *But see, e.g., Pub. Serv. Comm'n of Mo.*, 388 S.W.3d at 230–31 (Mo Ct. App. 2012) (“We find no statute . . . that grants the Commission the authority to limit a public utility's negligence liability involving personal injury or property damage.”).

⁵⁶⁶ E.g., *Brown v. United Water Del. Inc.*, No. 291,2009, 2010 WL 2052373, at *5–7 (Del. Super. Ct. May 20, 2010); *Md. Cas. Co. v. NSTAR Elec. Co.*, 30 N.E.3d 105, 110–15 (Mass. 2015) (allowing limitation on liability owed for economic harm (i.e., special, indirect, or consequential damages) even in face of gross negligence after concluding in dicta that there were no statutory or public policy bars to a tariff limiting liability for gross negligence); *Prof'l Answering Serv., Inc. v. Chesapeake & Potomac Tel. Co.*, 565 A.2d 55, 65 (D.C. 1989).

excluding liability for negligence entirely, some will place specific caps on the amount of damages that may be recovered.⁵⁶⁷ Others will limit the types of damages that may be sought, i.e., direct vs. consequential.⁵⁶⁸ Sometimes these provisions will distinguish between types of customers, i.e., residential versus non-residential.⁵⁶⁹ These caveats have been considered by some courts in assessing the reasonableness of tariff provisions because the caveats demonstrate that the electric utility is not seeking to immunize itself from liability entirely, but instead only in certain reasonable and narrowly prescribed circumstances.⁵⁷⁰ Notably, some courts have also held that tariff provisions are enforceable against both customers and non-customers,⁵⁷¹ while others have limited application solely to customers.⁵⁷²

⁵⁶⁷ See, e.g., *O'Neill*, 2020 WL 1889124, at *7 (noting previous cases had approved tariffs where liability was reasonably capped); see also, e.g., *Woodburn v. Nw. Bell Tel. Co.*, 275 N.W.2d 403, 404–05 (Iowa 1979) (approving tariff capping amount recoverable); *State Farm Fire & Cas. Co.*, 54 A.3d at 929–30 (Pa. 2012) (“The second paragraph establishes two scenarios which serve solely to limit the amount of recovery.”); *Providence Forge Oil Co. v. Chesapeake & Potomac Tel.*, 1966 WL 88488, at *3 (Va. Cir. Ct. 1966) (upholding limitation in tariff for errors in directory to a certain amount).

⁵⁶⁸ See, e.g., *Re Liability of Electric Power Cos. for Injury or Damages Resulting from Problems in Delivery of Elec. Power*, 82 Md. P.S.C. 92 (Md. Pub. Serv. Comm’n Apr. 5, 1991) (commission noting and approving of tariffs limiting the type of damages that could be recovered for interruptions in services); see also, e.g., *Md. Cas. Co.*, 30 N.E.3d at 109–10 (limiting liability for gross negligence, but only for special, indirect, or consequential damages); *Busalacchi v. San Diego Gas & Elec. Co.*, No. 12-CV-298-H-KSC, 2013 WL 12100702, at *4 (S.D. Cal. Sept. 26, 2013) (tariff provision barring special or consequential damages against utility enforced); *ZumBerge v. N. States Power Co.*, 481 N.W.2d 103, 106 (Minn. Ct. App. 1992) (assessing limitation on consequential damages from use of service provision).

⁵⁶⁹ See, e.g., *Md. Cas. Co.*, 30 N.E.3d at 115–16 (limiting liability where claim brought by nonresidential customer).

⁵⁷⁰ E.g., *id.*; *State Farm Fire*, 54 A.3d at 929.

⁵⁷¹ E.g., *U.S. Airways, Inc.* 361 P.3d at 946–47 (applying limit to non-customer).

⁵⁷² See, e.g., *Tyus v. Ind. Power & Light Co.*, 134 N.E.3d 389, 407 (Ind. Ct. App. 2019) (concluding commission lacked authority to shield utility from liability for injuries to noncustomers caused by utility’s negligence); see also, e.g., *Thrifty-Tel Inc. v. Bezenek*, 54 Cal. Rptr. 2d 468, 476 (Cal. Ct. App. 1996) (noting that it was not clear that Constitutional provisions authorizing the commission to set rates for services empowered it to liquidate a utility’s tort damages against third parties); *Colich & Sons v. Pacific Bell*, 244 Cal. Rptr. 714, 1225 at 1238–39, 1243–44 (Cal. Ct. App. 1988) (finding limitation of liability provisions did not apply in cases involving personal injuries by third parties); *Abel Holding Co., Inc. v. Am. Dist. Tel. Co.*, 371 A.2d 111, 113–14 (N.J. Super. Ct. App. Div. 1977) (rejecting argument that tariff limitation was binding on both customers and third parties).

Box 13: Tariff Language

The following tariff provisions are illustrative of the examples above. It is notable, however, that these types of provisions exist in utility tariffs in every state. As the provisions are often given the force and effect of law once they are approved by the state utility commission, judges will be bound by their limitations in adjudicating tort claims against utilities, although there is some room for interpretation.

Cap on Damages: PECO Energy Company (Pennsylvania)

12.1 Limitation on Liability for Service Interruptions and Variations: In all other circumstances, the liability of the Company to customers or other persons for damages, direct or consequential, including damage to computers and other electronic equipment and appliances, loss of business, or loss of production caused by any interruption, reversal, spike, surge or variation in supply or voltage, transient voltage, or any other failure in the supply of electricity shall in no event, unless caused by the willful and wanton misconduct, or both of the Company, exceed an amount in liquidated damages equivalent to the greater of \$1,000 or two times the charge to the customer for the service affected during the period in which such interruption, reversal, spike, surge or variation in supply or voltage, transient voltage, or any other failure in the supply of electricity occurs.⁵⁷³

Limitation on Type of Damages: Northern States Power Co. (Minnesota)

1.4 Continuity of Service: The Company will endeavor to provide continuous service but does not guarantee an uninterrupted or undisturbed supply of electric service. The Company shall not be responsible for any loss or damage resulting from the interruption or disturbance of service for any cause other than gross negligence of the Company. The Company shall not be liable for any loss of profits or other consequential damages resulting from the use of service or any interruption or disturbance of service.⁵⁷⁴

Distinguishing Between Customers: NSTAR Electric Co. (Massachusetts)

3. Limitation of Liability: “In any event, for non-residential Customers served under general service rates, the Company shall not be liable in contract, in tort (including negligence and M.G.L.c.93A), strict liability or otherwise for any special, indirect, or consequential damages whatsoever including, but not limited to, loss of profits or revenue, loss of use of equipment, cost of capital, cost of temporary equipment, overtime, business interruption, spoilage of goods, claims of Customers of the Customer or other economic harm.”⁵⁷⁵

⁵⁷³ PECO Energy Co., *Electric Service Tariff 22* (Sept. 1, 2020), <https://perma.cc/JT3G-RK48>.

⁵⁷⁴ Northern States Power Co., *Minnesota Electric Rate Book: General Rules and Regulations*, Sheet No. 6-4 (effective Apr. 1, 2010), <https://perma.cc/ZWR9-D63J>.

⁵⁷⁵ NSTAR ELECTRIC CO., TERMS AND CONDITIONS – DISTRIBUTION SERVICE, M.D.P.U. No. 3A, at 17 (Mar. 1, 2018), <https://perma.cc/5L6X-E4YX>.

While tariffs are generally binding and enforced by state courts, judges retain broad authority to interpret tariff provisions. The filed rate doctrine does not prevent courts from interpreting their scope and applicability.⁵⁷⁶ Some courts, viewing tariffs as having the force and effect of law, will apply the rules of statutory construction in interpreting ambiguous limitation provisions,⁵⁷⁷ while others use the rules of contract interpretation instead.⁵⁷⁸ Many courts have adopted the rule that exculpatory clauses in tariffs should be strictly construed against the electric utility and in favor of the customer.⁵⁷⁹ Ambiguous provisions in particular leave room for court interpretation,⁵⁸⁰ and a common interpretation rule is that limitations of liability for negligence must clearly express that purpose.⁵⁸¹

Examples of narrow interpretations abound. A Washington court interpreted a provision that barred liability for damages due to causes beyond the utility's reasonable control to only protect the electric utility where the outside cause—in this case, a windstorm—was the sole cause, but not where there was concurrent negligence on the utility's part.⁵⁸² New York courts have narrowly construed provisions limiting liability for *interruption* of service, finding that they do not limit liability for harms that result from the negligent *supply* of service.⁵⁸³ The Wisconsin Supreme Court concluded that stray voltage does not fall under the regular supply of electricity, and therefore, liability for harm from stray voltage is not limited by continuity of service limitation provisions.⁵⁸⁴ Relatedly, a Minnesota court narrowly interpreted a limitation on

⁵⁷⁶ *E.g.*, *Pac. Lightnet, Inc. v. Time Warner Telecom, Inc.*, 318 P.3d 97, 110 (Haw. 2013) (“It is well-established that ‘the filed-rate doctrine . . . does not preclude courts from interpreting the provisions of a tariff.’” (quoting *Brown v. MCI WorldCom Network Servs., Inc.*, 277 F.3d 1166, 1171–72 (9th Cir. 2002))).

⁵⁷⁷ *E.g.*, *Adams v. N. Ill. Gas Co.*, 809 N.E.2d 1248, 1268–69 (Ill. 2004).

⁵⁷⁸ *E.g.*, *Estate of Pearson ex rel. Latta v. Interstate Power & Light*, 700 N.W.2d 333, 343 (Iowa 2005).

⁵⁷⁹ *E.g.*, *Uncle Joe's Inc. v. L.M. Berry & Co.*, 156 P.3d 1113, 1118 (Alaska 2007); *Finagin v. Ark. Dev. Fin. Auth.*, 139 S.W.3d 797, 806 (Ark. 2003) (exculpatory provisions “are to be strictly construed against the party relying on them”).

⁵⁸⁰ *See Tesoro Refining & Mktg. Co. v. Pacific Gas & Elec. Co.*, 146 F. Supp.3d 1170, 1183–84 (N.D. Cal. 2015) (noting that while exculpatory tariff provisions are clearly enforceable, because PG&E's provision was ambiguous, the court could conclude that it did not bar liability in the specific case).

⁵⁸¹ *Id.* at 1183.

⁵⁸² *Nat'l Union Ins. Co. of Pittsburgh v. Puget Sound Power & Light*, 972 P.2d 481, 486 (Wash. Ct. App. 1999) (holding that utility's continuity of service provision “d[id] not absolve it from liability for service interruptions that it could have controlled or mitigated but for its unreasonable or unexplained failure to utilize available backup equipment in order to reestablish service with a minimum of delay while storm damage to regular equipment is being repaired”).

⁵⁸³ *E.g.*, *Allstate Ins. Co. v. Long Is. Power Auth.*, No. 14-CV-0444, 2015 WL 867064, at *3–4 (E.D.N.Y. Feb. 27, 2015); *Ahmed v. Consolidated Edison Co.*, 59 Misc.3d 323, 326–27 (N.Y. Civ. Ct. 2018).

⁵⁸⁴ *Schmidt v. N. States Power Co.*, 742 N.W.2d 294, 315 (Wis. 2007).

liability for consequential damages resulting from the “use of service,” concluding that a customer’s mere use of service could not be viewed as resulting in the presence of stray voltage on his farm, which caused his damages.⁵⁸⁵ There is even a difference among courts about how to interpret a tariff provision that says the electric utility is not liable except in cases of “willful default or neglect.” Some have interpreted this as “willful default or willful neglect” meaning that it limits liability for negligence;⁵⁸⁶ others have interpreted it as precluding liability except for negligence or willful default, which limits liability in fewer instances.⁵⁸⁷

VI. CONCLUSION

Climate resilience planning becomes increasingly salient as the consequences of climate change become ever more pronounced and pervasive. Electric utilities are not immune to climate change impacts; on the contrary, as operators of immense place-based infrastructure, they are particularly vulnerable. Already completed industry efforts make clear that climate resilience planning, capable of elucidating highly specific analysis and recommendation, is possible. The emergence of such knowable information necessarily implicates long-standing obligations already imposed on electric utilities. This Article explores two legal doctrines: public utility law and tort law structures, which we argue require electric utilities to engage in climate resilience planning.

The public utility law and tort law structures examined in this Article impose various obligations on electric utilities. Public utility law obligates electric utilities to meet, among other things, prudent investment, safe and adequate service, and reliability standards. Tort law obligates electric utilities to, among other things, avoid foreseeable harm when performing acts that could injure others. Both public utility law and tort law obligations can only be met if electric utilities institute effective planning processes. That is, law requires electric utilities to expend reasonable effort to uncover and incorporate relevant information into planning processes.

Science and evidence make clear that the consequences of climate change to electric utility assets is relevant—even critical—information to planning processes. And climate change impacts on electric utility infrastructure can be uncovered and incorporated as relevant information into planning processes with reasonable effort. It is, therefore, reasonable to conclude that electric utilities are obligated to expend reasonable efforts to uncover and incorporate consequences of climate change into planning processes.

⁵⁸⁵ *ZumBerge v. N. States Power Co.*, 481 N.W.2d 103, 106–07 (Minn. Ct. App. 1992).

⁵⁸⁶ *E.g.*, *Singer Co. v. Baltimore Gas & Elec. Co.*, 558 A.2d 419, 427–28 (Md. Ct. Spec. App. 1989).

⁵⁸⁷ *See, e.g.*, *Lupoli v. N. Utils. Nat. Gas, Inc.*, No. 991844, 2004 WL 1195308, *6 (Mass. Super. Ct. Feb. 11, 2004) (applying tort law) (tariff barring liability except for “willful default or neglect” does not preclude claims for negligence).
